

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 10,8 d
Edition : 22.3.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 046 701
Injection pump
Pump designation : PES6P110A720RS3019
Governor
Governor design. : RQV300/600...1050PA
293KR

Cust. part no. : *
Customer-spec. information
Customer : MACK
Engine : ENDT 675 C

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 40
Inlet press., bar : 0.21
Opening
pressure, bar : 270...273
Test lines : 9 681 230 710
Outside diameter
x Wall thickness
x Length mm : 6.35X1.70X914.40
(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.20...3.30
(3.15...3.35)
Rack travel in mm : 8.95...11.95
Firing order : 1-5-3-6-2-4
Phasing : 0-60-120-180-240-300
Phasing : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000
Rack travel in mm : 11.95...12.05
Del.quantity cm3/ : 14.0...14.2
100 s : (-)
Spread cm3 : 0.4
100 s : (-)
2nd speed rpm : 300
Rack travel in mm : 5.10...5.30
Del.quantity cm3/ : 1.3...2.1
100 s : (-)

GUIDE SLEEVE POSITION
Control-lever position
Degree: -1
Speed rpm : 1050
Rack travel in mm : 15.00...16.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1000
Del.quantity : 140.0...142.0
1000 : (138.0...144.0)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 15.50
Speed rpm : 1040...1060
2nd rack travel in: 9.10
Speed rpm : 1115...1145
3rd rack travel in: 0.00...7.50
Speed rpm : 1180

LOW IDLE 1
Control lever
position degrees: 15...23

Testing:
Speed rpm : 250
Minimum rack travel: 9.80
Speed rpm : 300
Rack travel in mm : 7.50...8.50
Rack travel in mm : 5.20
Speed rpm : 385...415
Speed rpm : 700
Maximum rack travel: 2.00
Speed rpm : 830
Rack travel in mm : -

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050
Rack travel in m: 11.90...12.00
2nd speed rpm : 1000
Rack travel in m: 11.95...12.05
3rd speed rpm : 900
Rack travel in m: 12.00...12.10
4th speed rpm : 700
Rack travel in m: 12.80...12.90
5th speed rpm : 600
Rack travel in m: 13.40...13.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm³/ : 153.0...159.0
1000 s: (151.0...161.0)
Speed rpm : 600
Del.quantity cm³/ : 184.5...188.5
1000 s: (183.0...190.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: ?
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 110.0...170.0
1000 s: (-)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 15.0...23.0

Remarks:

: MACK # 313 CC 5107 P
: 1

See VDT-I-MAC 002

PLE dimension = 0.670" - 0.744"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,0 n1
Edition : 26.3.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 046 715
Injection pump
Pump designation : PES6P110A720RS3024
Governor
Governor design. : RQV300/600...1050PA
350K

Cust. part no. : *

Customer-spec. information
Customer : MACK

Engine : ETA 676 A

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 40...45

Overflow valve
: 2 417 413 011

Inlet press., bar : 1.5

Opening
pressure, bar : 300

Test lines : 9 681 230 710

Outside diameter
x Wall thickness
x Length mm : 6.35X1.70X915.0

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.8...2.9
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.85

Del.quantity cm3/ : 17.25...17.45

100 s: (-)

Spread cm3 : 0.4

100 s: (-)

2nd speed rpm : 300
Rack travel in mm : 5.00
Del.quantity cm3/ : 1.5...2.5

100 s: (-)

Spread cm3 : 0.4

100 s: (-)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1095
Rack travel in mm : 16.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000
Del.quantity : 172.5...174.5
1000 : (170.0...177.0)

RATED SPEED

1st version

Control lever
position degrees: 60.5...65.5

Testing:

1st rack travel in: 12.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1190...1220
4th rack travel in: 1290
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 16...21

Testing:

Speed rpm : 250
Minimum rack travel: 9.8
Speed rpm : 400
Rack travel in mm : 3.80...5.20
Rack travel in mm : 2.00
Speed rpm : 680...740

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 13.85

2nd speed rpm : 800

Rack travel in m: 14.10...14.20

3rd speed rpm : 600

Rack travel in m: 14.75...14.85

4th speed rpm : 500

Rack travel in m: 14.35...14.45

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800

Del.quantity cm3/ : 188.0...194.0

1000 s: (186.0...196.0)

Speed rpm : 600

Del.quantity cm3/ : 218.0...222.0

1000 s: (216.0...224.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 120...180

1000 s: (-)

Rack travel in mm : 11.90...12.10

HIGH IDLE

1st version

Speed rpm : 1205

Rack travel in mm : 3.90...4.10

LOW IDLE

Speed rpm : 300

Del.quantity cm3/ : 15.0...25.0

1000 s: (-)

Remarks:

: MACK # 313 GC 5111 P

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See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SSC 19,0 a
Edition : 16.02.90
Replaces : 12.82
Test oil : ISO-4113

Combination no. : 0 402 046 729

Injection pump
Pump designation : PES6P130A320LS3091
EP type number : 0 412 036 700
Governor
Governor design. : RGV300...750PA614
Governor no. : 0 421 813 316

Customer-spec. information
Customer : SSCM

Engine : POYAUD-L685

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 9.00...12.00

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Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 750
Rack travel in mm : 15.00...15.10
Del.quantity cm3/ : 40.0...40.3
100 s: (40.0...40.3)
Spread cm3 : 0.6
100 s: (1.0)
2nd speed rpm : 300.0
Rack travel in mm : 5.7...6.1
Del.quantity cm3/ : 1.7...2.3
100 s: (1.3...2.7)
Spread cm3 : 1.0
100 s: (1.4)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL
1st speed rpm : 300
travel mm : 1.30...1.50
2nd speed rpm : 600
travel mm : 5.30...5.80
3rd speed rpm : 750
travel mm : 7.80...8.30

GUIDE SLEEVE POSITION
Control-lever position
Degree: -1
Speed rpm : 790
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 750
Del.quantity : 400.0...403.0
1000 : (400.0...403.0)
Spread cm3 : 6.00
1000 : (10.00)

RATED SPEED

1st version

Control lever
position degrees: 62...70

Testing:

1st rack travel in: 14.00

Speed rpm : 790...800

2nd rack travel in: 4.00

Speed rpm : 850...880

4th rack travel in: 1000

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 7...15

Testing:

Speed rpm : 100

Minimum rack travel: 7.40

Speed rpm : 300

Rack travel in mm : 5.80...6.00

CONSTANT REGULATION

Speed rpm : 325...435

START CUT-OUT

Speed 1/min : 220 (240)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.00

Speed rpm : 790...800

Remarks:

:

APPLICATION

Navy

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 12,0 f1
 Edition : 04.05.90
 Replaces : 4.85
 Test oil : ISO-4113
 Combination no. : 0 402 046 758
 Injection pump
 Pump designation : PES6P120A320RS3139
 EP type number : 0 412 026 718
 Governor
 Governor design. : RQV275...950PA728-1
 Governor no. : 0 421 813 465

Customer-spec. information
 Customer : RVI

Engine : MIDR 063540

1st version kW : 243.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 19.7...19.9

100 s: (19.4...20.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.20...5.40

Del.quantity cm3/ : 2.1...2.7

100 s: (1.8...3.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275
 travel mm : 1.30...1.70

2nd speed rpm : 450
 travel mm : 3.30...3.70

3rd speed rpm : 800
 travel mm : 5.60...6.00

4th speed rpm : 950
 travel mm : 6.70...6.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 197.0...199.0

1000 : (194.0...202.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 115...123

Testing:
1st rack travel in: 11.50
Speed rpm : 1020...1030
2nd rack travel in: 4.00
Speed rpm : 1155...1185
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 64...72

Testing:
Speed rpm : 200
Minimum rack travel: 7.10
Speed rpm : 275
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION
Speed rpm : 300...400

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.10...9.5040
2nd pressure hPa : 520
Rack travel in m: 11.80...11.90
3rd pressure hPa : 200
Rack travel in m: 10.10...10.30

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 950
Del.quantity cm³/ : 196.0...202.0
1000 s: (193.0...205.0)
Aneroid pressure h: -

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Speed rpm : 500
Del.quantity cm³/ : 120.0...122.0
1000 s: (117.0...125.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.50
Speed rpm : 1020...1030

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 155.0...185.0
1000 s: (151.0...189.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.20...5.60
Del.quantity cm³/ : 21.0...27.0
1000 s: (18.0...30.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Start-of-delivery mark 9° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 6,2 a
 Edition : 01.02.90
 Replaces : 9.3.87
 Test oil : ISO-4113
 Combination no. : 0 402 046 781
 Injection pump
 Pump designation : PES6P110A32ORS3182
 EP type number : 0 412 016 719
 Governor
 Governor design. : RQV275...1175PA833
 Governor no. : 0 421 813 583

Customer-spec. information
 Customer : RVI

Engine : MIDR 060226

1st version kW : 151.0
 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90
 : (4.75...4.65)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 13.80...13.90

Del.quantity cm3/ : 10.2...10.5

100 s: (9.9...10.7)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm : 6.2...6.4

Del.quantity cm3/ : 1.3...1.8

100 s: (1.0...2.0)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.20

2nd speed rpm : 450

travel mm : 3.50...3.90

3rd speed rpm : 800

travel mm : 5.50...5.90

4th speed rpm : 1175

travel mm : 7.80...8.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1250

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

Aneroid pressure h: 1000

Del.quantity : 102.0...105.0

1000 : (99.5...107.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 116...124

Testing:
1st rack travel in: 12.80
Speed rpm : 1245...1255
2nd rack travel in: 4.00
Speed rpm : 1395...1425
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 85...93

Testing:
Speed rpm : 200
Minimum rack travel: 8.90
Speed rpm : 275
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION
Speed rpm : 375...480

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.70...11.00
2nd pressure hPa : 500
Rack travel in m: 13.10...13.20
3rd pressure hPa : 240
Rack travel in m: 11.80...12.00

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 700
Del.quantity cm³/ : 102.0...106.0
1000 s: (99.0...109.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 48.0...51.0
1000 s: (45.5...53.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.80
Speed rpm : 1245...1255

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...150.0
1000 s: (116.0...154.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 6.20...6.40
Del.quantity cm³/ : 13.0...18.0
1000 s: (10.5...20.5)
Spread cm³ : 4.50
1000 s: (7.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 9,8 e
Edition : 04.05.90
Replaces : 25.8.89
Test oil : ISO-4113

Combination no. : 0 402 046 784

Injection pump
Pump designation : PES6P120A320RS3139
EP type number : 0 412 026 718
Governor
Governor design. : RQV275...1000PA728-2
Governor no. : 0 421 813 599

Customer-spec. information
Customer : RVI

Engine : MIDR 062045 E

1st version kw : 236.0
Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 16.0...16.2

100 s: (15.7...16.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 3.1...3.7
100 s: (2.8...4.0)

Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 0.90...1.10
2nd speed rpm : 450
travel mm : 3.30...3.70
3rd speed rpm : 800
travel mm : 5.60...6.00
4th speed rpm : 1000
travel mm : 7.00...7.20

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1170
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1000
Aneroid pressure h: 1000
Del.quantity : 160.0...162.0
1000 : (157.0...165.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 115...123

Testing:
1st rack travel in: 10.20
Speed rpm : 1065...1075
2nd rack travel in: 4.00
Speed rpm : 1180...1210
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 64...72

Testing:
Speed rpm : 200
Minimum rack travel: 7.20
Speed rpm : 275
Rack travel in mm : 5.30...5.70

CONSTANT REGULATION
Speed rpm : 230...320

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.10...8.50
2nd pressure hPa : 320
Rack travel in m: 10.50...10.60
3rd pressure hPa : 160
Rack travel in m: 9.10...9.30

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 182.5...188.5
1000 s: (179.5...191.5)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm³/ : 111.0...113.0
1000 s: (108.0...116.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.20
Speed rpm : 1065...1075

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 155.0...185.0
1000 s: (151.0...189.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.20...5.40
Del.quantity cm³/ : 31.0...37.0
1000 s: (28.0...40.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Start-of-delivery mark 9° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 12,0 f2
 Edition : 04.05.90
 Replaces : 7.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 046 791
 Injection pump
 Pump designation : PES6P120A320RS3139
 EP type number : 0 412 026 718
 Governor
 Governor design. : RQV275...950PA728-4
 Governor no. : 0 421 813 678

Customer-spec. information
 Customer : RVI

Engine : MIDR 063540 H

1st version kW : 264.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 21.2...21.4

100 s: (20.9...21.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 7.3...7.7

Del.quantity cm3/ : 2.3...2.9

100 s: (2.0...3.2)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275
 travel mm : 1.30...1.70

2nd speed rpm : 450
 travel mm : 3.30...3.70

3rd speed rpm : 800
 travel mm : 5.60...6.00

4th speed rpm : 950
 travel mm : 6.70...6.90

5th speed rpm : 1500
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 212.0...214.0

1000 : (209.0...217.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 118...126

Testing:
1st rack travel in: 12.30
Speed rpm : 1015...1025
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 65...73

Testing:
Speed rpm : 200
Minimum rack travel: 7.60
Speed rpm : 275
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION
Speed rpm : 295...400

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.30...9.60
2nd pressure hPa : 660
Rack travel in m: 12.60...12.70
3rd pressure hPa : 200
Rack travel in m: 10.20...10.40

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 950

Del.quantity cm³/ : 210.0...216.0
1000 s: (207.0...219.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 120.0...122.0
1000 s: (117.0...125.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.30
Speed rpm : 1015...1025

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...180.0
1000 s: (146.0...184.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.60...6.00
Del.quantity cm³/ : 23.0...29.0
1000 s: (20.0...32.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

:
Start-of-delivery mark 9° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,7 a14
 Edition : 16.02.90
 Replaces : 8.5.89
 Test oil : ISO-4113
 Combination no. : 0 402 046 807
 Injection pump
 Pump designation : PES6P110A820LS3131-1
 EP type number : 0 412 016 717
 Governor
 Governor design. : RQV300..1100PA916
 Governor no. : 0 421 813 748

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM447

1st version kW : 168.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40
 : (4.25...4.45)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.40...11.50

Del.quantity cm³/ : 13.7...13.9

100 s: (13.4...14.1)

Spread cm³ : 0.4

100 s: (0.8)

2nd speed rpm : 300.0
 Rack travel in mm : 7.6...7.8
 Del.quantity cm³/ : 1.4...2.0
 100 s: (1.1...2.3)
 Spread cm³ : 0.4
 100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.10...1.40
 2nd speed rpm : 450
 travel mm : 3.40...3.80
 3rd speed rpm : 1150
 travel mm : 7.90...8.30
 4th speed rpm : 1225
 travel mm : 9.10...9.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1160
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Del.quantity : 137.0...139.0
 1000 : (134.5...141.5)

Spread cm³ : 4.00
1000 : (8.00)

Remarks:

RATED SPEED

1st version
Control lever
position degrees: 114...122

Testing:
1st rack travel in: 10.40
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1195...1225
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 85...93

Testing:
Speed rpm : 200
Minimum rack trave: 9.20
Speed rpm : 300
Rack travel in mm : 7.60...7.80

CONSTANT REGULATION
Speed rpm : 300...500

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 600
Del.quantity cm³/ : 113.0...116.0
1000 s: (110.0...119.0)
Spread cm³ : 5.00
1000 s: (9.00)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.40
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...150.0
1000 s: (126.0...154.0)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 m3
Edition : 23.03.90
Replaces : -
Test oil : ISO-4113

Combination no. : 0 402 046 809A

Injection pump
Pump designation : PES6P120A720LS3229
EP type number : 0 412 026 733
Governor
Governor design. : RQ900PA661-2
Governor no. : 0 421 801 343

Cust. part no. : 2-7971

Customer-spec. information
Customer : MAN

Engine : D2866LE

1st version kW : 265.0
Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
x Wall thickness
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90
: (3.75...3.95)
Rack travel in mm : 9.00...12.00
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 28.9...29.1

100 s: (28.6...29.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0
Rack travel in mm : 4.1...4.7
Del.quantity cm3/ : 2.4...3.0
100 s: (2.1...3.3)

Spread cm3 : 0.8
100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 850
Del.quantity : 289.0...291.0
1000 : (286.0...294.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Testing:
1st rack travel in: 11.50
Speed rpm : 900...905
2nd rack travel in: 4.00
Speed rpm : 940...955
4th rack travel in: 1050
Speed rpm : 0.00...1.00

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 240.0...260.0
1000 s: (236.0...264.0)
Rack travel in mm : 12.50...12.60

Remarks:

:

APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 m1
 Edition : 30.03.90
 Replaces : 15.8.89
 Test oil : ISO-4113
 Combination no. : 0 402 046 810
 Injection pump
 Pump designation : PES6P120A720LS3229
 EP type number : 0 412 026 733
 Governor
 Governor design. : RQ750PA661-4
 Governor no. : 0 421 801 361

Customer-spec. information
 Customer : MAN

Engine : D2866TE

1st version kW : 190.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90
 : (3.75...3.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 23.1...23.3

100 s: (22.8...23.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.5...4.9

Del.quantity cm3/ : 2.4...3.0

100 s: (2.1...3.3)

Spread cm3 : 0.8

100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 231.0...233.0

1000 : (228.0...236.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 10.20

Speed rpm : 750...755

2nd rack travel in: 4.00

Speed rpm : 782...795

4th rack travel in: 950

Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20
Speed rpm : 750...755

Remarks:

:

APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 14,9 i
Edition : 19.03.90
Replaces : 9.11.89
Test oil : ISO-4113

Combination no. : 0 402 048 049

Injection pump
Pump designation : PES8P12CA32ORS523
EP type number : 0 412 028 024
Governor
Governor design. : RQV275...1050PA665-3
Governor no. : 0 421 813 677

Customer-spec. information
Customer : RVI

Engine : MIVRO83530 H

1st version kW : 299.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 9.00...12.00
Firing order : 1- 8- 4- 2- 7- 3-
6- 5

Phasing : 0-45-90-135-180-225-
270-315
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed	rpm	: 1050
Rack travel in mm		: 11.70...11.80
Del.quantity cm3/		: 19.6...19.8
	100 s:	(19.3...20.1)
Spread	cm3	: 0.5
	100 s:	(0.9)
2nd speed	rpm	: 300.0
Rack travel in mm		: 4.9...5.1
Del.quantity cm3/		: 2.3...2.9
	100 s:	(2.0...3.2)
Spread	cm3	: 0.8
	100 s:	(1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed	rpm	: 275
travel mm		: 0.60...1.00
2nd speed	rpm	: 450
travel mm		: 3.60...4.00
3rd speed	rpm	: 700
travel mm		: 5.40...5.80
4th speed	rpm	: 1050
travel mm		: 7.90...8.10
5th speed	rpm	: 1400
travel mm		: 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1100
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Aneroid pressure h: 750

Del.quantity : 196.0...198.0
1000 : (193.0...201.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 118...126

Testing:
1st rack travel in: 10.70
Speed rpm : 1105...1115
2nd rack travel in: 4.00
Speed rpm : 1205...1235
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 82...90

Testing:
Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION
Speed rpm : 290...410

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 750

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.60...10.20
2nd pressure hPa : 170
Rack travel in m: 11.10...11.30
3rd pressure hPa : 130
Rack travel in m: 10.10...10.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 750

Speed rpm : 650
Del.quantity cm3/ : 184.0...190.0
1000 s: (181.0...193.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 130.0...132.0
1000 s: (127.0...135.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.70 -
Speed rpm : 1105...1115

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...180.0
1000 s: (156.0...184.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.90...5.10
Del.quantity cm3/ : 23.0...29.0
1000 s: (20.0...32.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

:
Start-of-delivery mark 11.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 10,0 w
Edition : 15.03.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 075 700
Injection pump
Pump designation : PES5P110A720LS3218
EP type number : 0 412 015 702
Governor
Governor design. : RSV350...1100POA487-
7
Governor no. : 0 421 833 314

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM449

1st version kW : 140.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40
: (4.25...4.45)
Rack travel in mm : 9.00...12.00
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 13.5...13.7

100 s: (13.2...13.9)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 350.0
Rack travel in mm : 6.3...6.7
Del.quantity cm3/ : 1.2...1.8
100 s: (0.9...2.0)
Spread cm3 : 0.4
100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3

Speed rpm : 800
Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1080
Del.quantity : 135.0...137.0
1000 : (132.5...139.5)
Spread cm3 : 4.00
1000 : (8.00)

RATED SPEED

1st version
Control lever
position degrees: 90...98

Testing:
1st rack travel in: 9.80
Speed rpm : 1130...1140
2nd rack travel in: 4.00

Speed rpm : 1190...1220
4th rack travel in: 1250
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 66...74
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.5
Speed rpm : 350
Rack travel in mm : 6.30...6.70
Rack travel in mm : 2.00
Speed rpm : 470...530

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm3/ : 114.0...118.0
1000 s: (111.0...121.0)
Spread cm3 : 6.00
1000 s: (9.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 1130...1140

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...160.0
1000 s: (136.0...164.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 10,0 w 1
 Edition : 15.03.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 075 701
 Injection pump
 Pump designation : PES5P110A720LS3218
 EP type number : 0 412 015 702
 Governor
 Governor design. : RSV350...1100POA487-
 8
 Governor no. : 0 421 833 315

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM449

1st version kW : 147.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40
 : (4.25...4.45)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 12.10...12.20

Del.quantity cm³/ : 14.4...14.4

100 s: (14.1...14.6)

Spread cm³ : 0.4

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 6.3...6.7

Del.quantity cm³/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm³ : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del.quantity : 144.0...144.0

1000 : (141.5...146.5)

Spread cm³ : 4.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Testing:

1st rack travel in: 10.50
Speed rpm : 1130...1140
2nd rack travel in: 4.00
Speed rpm : 1190...1220
4th rack travel in: 1250
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 66...74
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.5
Speed rpm : 350
Rack travel in mm : 6.30...6.70
Rack travel in mm : 2.00
Speed rpm : 470...530

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm³/ : 124.0...128.0
1000 s: (121.0...131.0)
Spread cm³ : 6.00
1000 s: (9.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.50
Speed rpm : 1130...1140

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (136.0...164.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,6 y 1
 Edition : 02.05.90
 Replaces : 28.9.89
 Test oil : ISO-4113
 Combination no. : 0 402 076 722
 Injection pump
 Pump designation : PES6P120A720RS3203
 EP type number : 0 412 026 728
 Governor
 Governor design. : RSV400...1100P2A534
 Governor no. : 0 421 833 275

Customer spec. information
 Customer : JOHN DEERE

Engine : 6466 HF-050

1st version kW : 194.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65
 : (3.50...3.70)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 15.6...15.8

100 s: (15.4...16.1)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 4.8...5.0

Del.quantity cm3/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 156.5...158.5

1000 : (154.0...161.0)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 11.00
Speed rpm : 1145...1155
2nd rack travel in: 4.00
Speed rpm : 1200...1210
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 16...24
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 4.80...5.00

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.00...12.10
2nd speed rpm : 750
Rack travel in m: 12.80...13.00

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.30...10.50

Measurement

Speed 1/min : 500

1st pressure hPa : 605
Rack travel in m: 11.00...11.10
2nd pressure hPa : 780
Rack travel in m: 12.10...12.50
3rd pressure hPa : 1200
Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 750
Del.quantity cm³/ : 174.5...179.5
1000 s: (172.0...182.0)
Aneroid pressure h: -
Speed rpm : 800
Del.quantity cm³/ : 117.5...121.5
1000 s: (114.5...124.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 90.0...110.0
1000 s: (85.0...115.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ : 17.5...22.5
1000 s: (15.0...25.0)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE32035

Adjustment without torque-control
spring retainer with 0,5 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Starting/full-load transition speed
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,6 y
Edition : 02.05.90
Replaces : 28.9.89
Test oil : ISO-4113

Combination no. : 0 402 076 723

Injection pump
Pump designation : PES6P120A720RS3203
EP type number : 0 412 026 728
Governor
Governor design. : RSV400...1100P2A534-
1
Governor no. : 0 421 833 276

Customer-spec. information
Customer : JOHN DEERE

Engine : 6466 AF-050

1st version kW : 180.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter
x Wall thickness : 6.00X3.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 27...29

B01

Prestroke mm : 3.55...3.65
(3.50...3.70)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.80...11.90

Del.quantity cm3/ : 15.0...15.2

100 s: (14.7...15.4)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 4.8...5.0

Del.quantity cm3/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 150.0...152.0

1000 : (147.5...154.5)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 10.80
Speed rpm : 1145...1155
2nd rack travel in: 4.00
Speed rpm : 1200...1210
4th rack travel in: 1350
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 16...24
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 4.80...5.00

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 11.80...11.90
2nd speed rpm : 700
Rack travel in m: 12.60...12.80

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 12.60...12.80

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.40...10.60
2nd pressure hPa : 720
Rack travel in m: 11.00...11.10
3rd pressure hPa : 895
Rack travel in m: 11.80...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 700
Del.quantity cm³/ : 173.5...178.5
1000 s: (171.0...181.0)
Aneroid pressure h: -
Speed rpm : 800
Del.quantity cm³/ : 120.0...124.0
1000 s: (117.0...127.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.80
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 90.0...110.0
1000 s: (85.0...115.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ : 17.5...22.5
1000 s: (15.0...25.0)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE32033

Adjustment without torque-control
spring retainer with 0,5 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Starting/full-load transition speed
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 10,1 f
Edition : 02.05.90
Replaces : 7.4.89
Test oil : ISO-4113

Combination no. : 0 402 076 726

Injection pump
Pump designation : PES6P110A720RS3209
EP type number : 0 412 016 722
Governor
Governor design. : RSV400...1050POA537
Governor no. : 0 421 833 287

Customer-spec. information
Customer : JOHN DEERE

Engine : 6619 AT 06

1st version kW : 172.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness : 6.00x3.00x600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55
: (3.40...3.60)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.20...11.30

Del.quantity cm³/ : 16.7...16.9

100 s: (16.5...17.2)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 5.0...5.2

Del.quantity cm³/ : 1.6...2.1

100 s: (1.3...2.3)

Spread cm³ : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 167.5...169.5

1000 : (165.0...172.0)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 39...47

Testing:

1st rack travel in: 10.20

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1150...1160

3rd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1250
Speed rpm : 0.30...1.40

LOW IDLE 1
Control lever
position degrees: 19...27
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.6

Testing:
Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 5.00...5.20

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 11.20...11.30
2nd speed rpm : 700
Rack travel in m: 11.60...11.80

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 700
Del.quantity cm³/ : 171.5...176.5
1000 s: (169.0...179.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.20
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 175.0...195.0
1000 s: (170.0...200.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.00...5.20
Del.quantity cm³/ : 16.0...21.0
1000 s: (13.5...23.5)
Spread cm³ : 4.50
1000 s: (7.50)

Remarks:

: JOHN DEERE # RE33898

Adjustment without torque-control
spring retainer with 0,5 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

The stop position of the control rod
must be easily reached with the stop
lever

Start-of-delivery mark at 14° angular
displacement of the cam after start of
delivery of cylinder 1 with control-rod
travel = 10.50 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,7 b
Edition : 02.05.90
Replaces : 28.9.89
Test oil : ISO-4113

Combination no. : 0 402 076 727

Injection pump
Pump designation : PES6P120A720RS3203
EP type number : 0 412 026 728
Governor
Governor design. : RSV400...1100P2A534-
2
Governor no. : 0 421 833 290

Customer-spec. information
Customer : JOHN DEERE

Engine : 6076AF

1st version kW : 160.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X3.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65
: (3.50...3.70)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 13.4...13.6

100 s: (13.1...13.8)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 4.8...5.0

Del.quantity cm3/ : 1.7...2.2
100 s: (1.5...2.5)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 134.0...136.0
1000 : (131.5...138.5)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 10.10
Speed rpm : 1145...1155
2nd rack travel in: 4.00
Speed rpm : 1200...1210
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 16...24
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 4.30...4.50

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 11.10...11.20
2nd speed rpm : 700
Rack travel in m: 12.40...12.60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.50...10.70

Measurement

Speed 1/min : 500

1st pressure hPa : 470
Rack travel in m: 11.20...11.30
2nd pressure hPa : 605
Rack travel in m: 11.80...12.20
3rd pressure hPa : 900
Rack travel in m: 12.40...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm3/ : 165.5...170.5
1000 s: (163.0...173.0)
Aneroid pressure h: -
Speed rpm : 800
Del.quantity cm3/ : 122.0...126.0
1000 s: (119.0...129.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.10
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 90.0...110.0
1000 s: (85.0...115.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 4.80...5.00
Del.quantity cm3/ : 17.5...22.5
1000 s: (15.0...25.0)
Spread cm3 : 6.00
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE32034

Adjustment without torque-control
spring retainer with 0,5 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

The stop position of the control rod
must be easily reached with the stop
lever

Start-of-delivery mark 10.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,7 c
Edition : 01.02.90
Replaces : 28.9.89
Test oil : ISO-4113

Combination no. : 0 402 076 728

Injection pump
Pump designation : PES6P120A720RS3203
EP type number : 0 412 026 728
Governor
Governor design. : RSV425...1050P2A489-
2
Governor no. : 0 421 833 291

Customer-spec. information
Customer : JOHN DEERE

Engine : 6076 HRW01

1st version kW : 175.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter
x Wall thickness : 6.00X3.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65
: (3.50...3.70)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 16.6...16.8

100 s: (16.3...17.0)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 425.0
Rack travel in mm : 5.5...5.7
Del.quantity cm3/ : 3.1...3.6
100 s: (2.9...3.9)
Spread cm3 : 0.6
100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...0.70

Governor spring pre-tension
Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Aneroid pressure h: 1200
Del.quantity : 166.0...168.0
1000 : (163.5...170.5)
Spread cm3 : 4.00
1000 : (6.50)

RATED SPEED

1st version
Control lever
position degrees: 40...48

Testing:

1st rack travel in: 11.40
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1160...1170
4th rack travel in: 1250
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 20...28
Setting point w/out bumper spring
Speed rpm : 425
Rack travel in mm : 5.1

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 425
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00
Speed rpm : 610...670

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 12.40...12.50
2nd speed rpm : 600
Rack travel in m: 13.60...13.80

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 12.10...12.30
2nd pressure hPa : 725
Rack travel in m: 12.50...12.60
3rd pressure hPa : 815
Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ : 197.5...202.5
1000 s: (195.0...205.0)
Aneroid pressure h: -
Speed rpm : 800

Del.quantity cm³/ : 157.0...161.0
1000 s: (154.0...164.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.40
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 90.0...110.0
1000 s: (85.0...115.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 425
Rack travel in mm : 5.50...5.70
Del.quantity cm³/ : 31.5...36.5
1000 s: (29.0...39.0)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE32888

Adjustment without torque-control
spring retainer with 0,5 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

The stop position of the control rod
must be easily reached with the stop
lever

Start-of-delivery mark 10.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 10,1 g
Edition : 02.05.90
Replaces : 28.9.89
Test oil : ISO-4113

Combination no. : 0 402 076 730

Injection pump
Pump designation : PES6P110A720RS3217
EP type number : 0 412 016 724
Governor
Governor design. : RSV550...1050P2A534-
3
Governor no. : 0 421 833 304

Customer-spec. information
Customer : JOHN DEERE

Engine : 6619ATD7

1st version kW : 205.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 103

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter
x Wall thickness : 6.00X2.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55
: (3.40...3.60)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 18.3...18.5

100 s: (18.1...18.8)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 550.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 3.3...3.7

100 s: (3.1...3.9)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity : 183.5...185.5

1000 : (181.0...188.0)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 41...49

Testing:

1st rack travel in: 11.10
Speed rpm : 1095...1105
2nd rack travel in: 4.00
Speed rpm : 1180...1190
3rd rack travel in: 4.00
Speed rpm : 1195...1215
4th rack travel in: 1275
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 22...30
Setting point w/out bumper spring
Speed rpm : 550
Rack travel in mm : 4.8

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 550
Rack travel in mm : 5.20...5.40

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.10...12.20

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.60...10.80
2nd pressure hPa : 295
Rack travel in m: 11.00...11.10
3rd pressure hPa : 510
Rack travel in m: 11.70...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 167.0...171.0
1000 s: (165.0...173.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack travel: 11.10
Speed rpm : 1095...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 180.0...200.0
1000 s: (175.0...205.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 550
Rack travel in mm : 5.20...5.40
Del.quantity cm³/ : 33.0...37.0
1000 s: (31.0...39.0)
Spread cm³ : 4.50
1000 s: (7.50)

Remarks:

: JOHN DEERE # RE36078

The stop position of the control rod
must be easily reached with the stop
lever

Start-of-delivery mark 10.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 10,1 g1
 Edition : 01.02.90
 Replaces : 28.9.89
 Test oil : ISO-4113
 Combination no. : 0 402 076 731
 Injection pump
 Pump designation : PES6P110A720RS3217
 EP type number : 0 412 016 724
 Governor
 Governor design. : RSV400...1050P2A534-4
 Governor no. : 0 421 833 305

Customer-spec. information
 Customer : JOHN DEERE

Engine : 6101 H

1st version kW : 224.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness : 6.00X3.00X600
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55
 : (3.40...3.60)

Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.10...13.20

Del.quantity cm3/ : 21.7...21.9

100 s: (21.4...22.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 5.8...6.0

Del.quantity cm3/ : 2.6...3.1

100 s: (2.3...3.3)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1200

Del.quantity : 217.0...219.0

1000 : (214.5...221.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 36...44

Testing:

1st rack travel in: 12.10

Speed rpm : 1090...1100

2nd rack travel in: 4.00
Speed rpm : 1170...1180
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 14...22
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 5.80...6.00

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 13.10...13.20
2nd speed rpm : 700
Rack travel in m: 14.10...14.30

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.90...11.10
2nd pressure hPa : 325
Rack travel in m: 11.60...11.70
3rd pressure hPa : 640
Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 700
Del.quantity cm³/ : 233.5...238.5
1000 s: (231.0...241.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 160.0...164.0
1000 s: (157.0...167.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.10
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 165.0...185.0
1000 s: (160.0...190.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.80...6.00
Del.quantity cm³/ : 26.0...31.0
1000 s: (23.5...33.5)
Spread cm³ : 4.50
1000 s: (7.50)

Remarks:

: JOHN DEERE # RE36881

Adjustment without torque-control
spring retainer with 0,5 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Starting/full-load transition speed
from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle
after start of delivery cyl. 1

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,7 d 3
 Edition : 19.03.90
 Replaces : 7.2.89
 Test oil : ISO-4113
 Combination no. : 0 402 076 732
 Injection pump
 Pump designation : PES6P110A82OLS3131-1
 EP type number : 0 412 016 717
 Governor
 Governor design. : RSV350..1100POA487-6
 Governor no. : 0 421 833 311

Customer-spec. information
 Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 177.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40
 : (4.25...4.45)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 11.70...11.80

Del.quantity cm³/ : 14.4...14.6

100 s: (14.1...14.8)

Spread cm³ : 0.4

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 7.0...7.3

Del.quantity cm³/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm³ : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del.quantity : 144.0...146.0

1000 : (141.5...148.5)

Spread cm³ : 4.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 93...101

Testing:

1st rack travel in: 10.70

Speed rpm : 1130...1140
2nd rack travel in: 4.00
Speed rpm : 1190...1220
4th rack travel in: 1350
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.1

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 350
Rack travel in mm : 7.00...7.30
Rack travel in mm : 2.00
Speed rpm : 400...440

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm3/ : 123.0...127.0
1000 s: (120.0...130.0)
Spread cm3 : 6.00
1000 s: (9.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.70
Speed rpm : 1130...1140

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...150.0
1000 s: (126.0...154.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.00...7.30
Del.quantity cm3/ : 14.0...20.0
1000 s: (11.0...23.0)
Spread cm3 : 4.50
1000 s: (7.00)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,7 g
Edition : 02.05.90
Replaces : 28.9.89
Test oil : ISO-4113

Combination no. : 0 402 076 733

Injection pump
Pump designation : PES6P110A720RS3224
EP type number : 0 412 016 726
Governor
Governor design. : RSV475...1050P2A534-
5
Governor no. : 0 421 833 313

Cust. part no. : RE39856

Customer-spec. information
Customer : JOHN DEERE

Engine : 6101 AT 001

1st version kW : 170.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X3.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.35...3.45
: (3.30...3.50)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 15.8...16.0

100 s: (15.6...16.2)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 475.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 1.0...1.4

100 s: (0.8...1.7)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 700

Del.quantity : 158.0...160.0

1000 : (156.0...162.0)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever
position degrees: 36...44

Testing:
1st rack travel in: 12.20
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1135...1145
3rd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1250
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 15...23
Setting point w/out bumper spring
Speed rpm : 475
Rack travel in mm : 5.6

Testing:
Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 475
Rack travel in mm : 6.00...6.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 13.20...13.30

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 11.10...11.30
2nd pressure hPa : 335
Rack travel in m: 12.80...12.90
3rd pressure hPa : 185
Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 120.0...124.0
1000 s: (117.0...127.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 125.0...145.0
1000 s: (120.0...150.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 475
Rack travel in mm : 6.00...6.20
Del.quantity cm³/ : 10.5...14.5
1000 s: (8.0...17.0)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:
The stop position of the control rod 56
must be easily reached with the stop
lever

Start-of-delivery mark 10.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,7 d 4
Edition : 23.03.90
Replaces : 29.3.89
Test oil : ISO-4113

Combination no. : 0 402 076 734

Injection pump
Pump designation : PES6P110A820LS3131-1
EP type number : 0 412 016 717
Governor
Governor design. : RSV350..1100POA487-9
Governor no. : 0 421 833 316

Customer-spec. information
Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 168.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40
: (4.25...4.45)
Rack travel in mm : 9.00...12.00
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 13.5...13.7

100 s: (13.2...13.9)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 350.0

Rack travel in mm : 6.8...7.0

Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del.quantity : 135.0...137.0

1000 : (132.5...139.5)

Spread cm3 : 4.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 95...103

Testing:

1st rack travel in: 10.00

Speed rpm : 1130...1140
2nd rack travel in: 4.00
Speed rpm : 1190...1220
4th rack travel in: 1350
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 69...77
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.9

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 350
Rack travel in mm : 6.80...7.00
Rack travel in mm : 2.00
Speed rpm : 400...440

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm3/ : 111.0...115.0
1000 s: (108.0...118.0)
Spread cm3 : 6.00
1000 s: (9.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00
Speed rpm : 1130...1140

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...160.0
1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.80...7.00
Del.quantity cm3/ : 14.0...20.0
1000 s: (11.0...23.0)
Spread cm3 : 4.50
1000 s: (7.00)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 10,1 i
Edition : 01.02.90
Replaces : -
Test oil : ISO-4113

Combination no. : 0 402 076 735

Injection pump
Pump designation : PES6P110A720RS3242
EP type number : 0 412 016 731
Governor
Governor design. : RSV400...1050POA513-
1
Governor no. : 0 421 833 327

Customer-spec. information
Customer : JOHN DEERE

Engine : 6619AE03

1st version kW : 212.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 200...215

Test nozzle holder
assembly : 1 688 901 103

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55
(3.40...3.60)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 14.00...14.10

Del.quantity cm³/ : 20.8...21.0

100 s: (20.5...21.2)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 6.8...7.0

Del.quantity cm³/ : 4.0...4.5

100 s: (3.7...4.7)

Spread cm³ : 0.9

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 800

Del.quantity : 208.0...210.0

1000 : (205.5...212.5)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever
position degrees: 37...45

Testing:

1st rack travel in: 13.00
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1160...1170
3rd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 17...25
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 6.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 6.80...7.00

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 14.00...14.20
2nd speed rpm : 600
Rack travel in m: 14.20...14.30

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 800
Rack travel mm : 14.20...14.30

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 11.40...11.60
2nd pressure hPa : 170
Rack travel in m: 12.20...12.30
3rd pressure hPa : 350
Rack travel in m: 13.20...13.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800
Speed rpm : 600

Del.quantity cm³/ : 222.0...227.0
1000 s: (219.5...229.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 144.5...148.5
1000 s: (141.5...151.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.00
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 145.0...175.0
1000 s: (140.0...180.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 6.80...7.00
Del.quantity cm³/ : 40.0...45.0
1000 s: (37.5...47.5)
Spread cm³ : 9.00
1000 s: (12.00)

Remarks:

: JOHN DEERE # RE42224

The stop position of the control rod
must be easily reached with the stop
lever

Start-of-delivery mark at 14° angular
displacement of the cam after start of
delivery of cylinder 1 with control-rod
travel = 10.50 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,6 g 9
 Edition : 02.05.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 076 737
 Injection pump
 Pump designation : PES6P110A720RS3083-1
 EP type number : 9 410 231 027
 Governor
 Governor design. : RSV475...1050POA455-4
 Governor no. : 0 421 833 340

Customer-spec. information
 Customer : JOHN DEERE

Engine : 6466AT014

1st version kW : 151.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55
 : (3.40...3.60)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.70...11.80

Del.quantity cm3/ : 13.1...13.3

100 s: (12.9...13.5)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 475.0
 Rack travel in mm : 6.0...6.2
 Del.quantity cm3/ : 1.1...1.5
 100 s: (0.9...1.7)
 Spread cm3 : 0.6
 100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 6.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Del.quantity : 131.5...133.5
 1000 : (129.5...135.5)
 Spread cm3 : 4.00
 1000 : (6.50)

RATED SPEED

1st version
 Control lever
 position degrees: 37...45

Testing:

1st rack travel in: 10.70
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1195...1205
3rd rack travel in: 4.00
Speed rpm : 1210...1240
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 23...31
Setting point w/out bumper spring
Speed rpm : 475
Rack travel in mm : 5.6

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 475
Rack travel in mm : 6.00...6.20

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 11.70...11.80
2nd speed rpm : 700
Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm³/ : 136.5...140.5
1000 s: (134.5...142.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.70
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 155.0...175.0
1000 s: (150.0...180.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 475
Rack travel in mm : 6.00...6.20
Del.quantity cm³/ : 11.0...15.0
1000 s: (9.0...17.0)

Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE44340

Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Starting/full-load transition speed
from holding magnet = 450 1/min.

Start-of-delivery mark 12° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 10,1 i
 Edition : 02.05.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 076 738
 Injection pump
 Pump designation : PES6P110A720RS3251
 EP type number : 0 412 016 733
 Governor
 Governor design. : RSV400...1050POA513-
 1
 Governor no. : 0 421 833 327

Customer-spec. information
 Customer : JOHN DEERE

Engine : 6619AE03

1st version kW : 212.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 200...215

Test nozzle holder
 assembly : 1 688 901 103

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55
 : (3.40...3.60)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.70...12.80

Del.quantity cm³/ : 19.6...19.8

100 s: (19.4...20.0)

Spread cm³ : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.3...5.5

Del.quantity cm³/ : 3.2...3.7

100 s: (3.0...3.9)

Spread cm³ : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity : 196.5...198.5

1000 : (194.5...200.5)

Spread cm³ : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever
position degrees: 40...48

Testing:

1st rack travel in: 11.70
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1160...1170
3rd rack travel in: 4.00
Speed rpm : 1155...1185
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 19...27
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.9

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 4.80...5.00

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 12.70...12.80
2nd speed rpm : 600
Rack travel in m: 13.70...13.80

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.80...10.00
2nd pressure hPa : 225
Rack travel in m: 10.90...11.00
3rd pressure hPa : 475
Rack travel in m: 12.50...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 600

Del.quantity cm3/ : 236.5...240.5
1000 s: (234.5...242.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 144.0...148.0
1000 s: (142.0...150.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.70
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 180.0...210.0
1000 s: (175.0...215.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 32.0...37.0
1000 s: (30.0...39.0)
Spread cm3 : 6.00
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE42224
Starting/full-load transition speed
from holding magnet = 450 1/min.

Start-of-delivery mark at 14° angular
displacement of the cam after start of
delivery of cylinder 1 with control-rod
travel = 10.50 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : BAO 14,9 a
Edition : 01.02.90
Replaces : 15.12.89
Test oil : ISO-4113

Combination no. : 0 402 630 802

Injection pump
Pump designation : PE12P120A120RS7192
EP type number : 0 412 620 818
Governor
Governor design. : RQV325...1500PA930
Governor no. : 0 421 813 804

Customer-spec. information
Customer : BAUDOUIN

Engine : 12 F 120 SR

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
x Wall thickness
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50
: (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 1- 12- 9- 5- 3- 8-
11- 4- 2- 10- 7- 6

Phasing : 0-45-60-105-120-165-
180-225-240-285-300-
345

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 16.9...17.1

100 s: (16.6...17.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.3...4.7

Del.quantity cm3/ : 1.5...2.1

100 s: (1.2...2.4)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.60...1.00

2nd speed rpm : 700

travel mm : 2.90...3.30

3rd speed rpm : 1500

travel mm : 8.10...8.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1700

Rack travel in mm : 4.50...7.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1500

Aneroid pressure h: 900

Del.quantity : 169.0...171.0

1000 : (166.0...174.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 116...124

Testing:
1st rack travel in: 10.50
Speed rpm : 1540...1550
2nd rack travel in: 4.00
Speed rpm : 1630...1660
4th rack travel in: 1750
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 78...86

Testing:
Speed rpm : 100
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.40...4.60

CONSTANT REGULATION
Speed rpm : 320...460

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.50...11.60

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.00...10.10
2nd pressure hPa : 400
Rack travel in m: 11.00...11.10
3rd pressure hPa : 360
Rack travel in m: 10.40...10.60

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 127.0...131.0
1000 s: (124.0...134.0)

BREAKAWAY

B26

1st version
1mm rack travel less than
full load rack tr: 10.50
Speed rpm : 1540...1550

Remarks:
:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : BAO 31,8 c3
Edition : 01.02.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 630 805
Injection pump
Pump designation : PE12P120A120RS7106
EP type number : 0 412 620 800
Governor
Governor design. : RQV350...900PA935-1
Governor no. : 0 421 813 820

Customer-spec. information
Customer : BAUDOUIN

Engine : V12P15-2

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 074

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70
: (3.55...3.75)

Rack travel in mm : 9.00...12.00

Firing order : 1- 12- 9- 4- 5- 8-
11- 2- 3- 10- 7- 6

Phasing : 0-45-60-105-120-165-
180-225-240-285-300-
345

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 33.9...34.1

100 s: (33.6...34.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.30...1.70

2nd speed rpm : 500

travel mm : 3.00...3.60

3rd speed rpm : 700

travel mm : 5.30...5.90

4th speed rpm : 900

travel mm : 7.70...7.90

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 930

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 339.0...341.0

1000 : (336.0...344.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 118...126

Testing:
1st rack travel in: 11.00
Speed rpm : 940...950
2nd rack travel in: 4.00
Speed rpm : 1000...1030
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 82...90

Testing:
Speed rpm : 100
Minimum rack trave: 6.10
Speed rpm : 350
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 330...450

START CUT-OUT

Speed 1/min : 270 (290)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.00
Speed rpm : 940...950

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 i2
 Edition : 12.01.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 869
 Injection pump
 Pump designation : PE6P120A720RS70200
 EP type number : 0 412 626 831
 Governor
 Governor design. : RQV200...1000PA539
 -10
 Governor no. : 0 421 813 726

Customer-spec. information
 Customer : SCANIA

Engine : DSC11 17

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.5...4.9

Del.quantity cm3/ : 1.5...1.9

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225
 travel mm : 1.20...1.60

2nd speed rpm : 350
 travel mm : 2.30...2.90

3rd speed rpm : 650
 travel mm : 4.40...5.00

4th speed rpm : 1045
 travel mm : 8.40...8.60

5th speed rpm : 1150
 travel mm : 9.70...10.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1050

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 201.0...203.0

1000 : (198.0...206.0)

Spread cm³ : 6.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 58...66

Testing:
1st rack travel in: 11.80
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1135...1165
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 6...14

Testing:
Speed rpm : 100
Minimum rack travel: 6.10
Speed rpm : 225
Rack travel in mm : 4.50...4.70
Rack travel in mm : 2.00
Speed rpm : 340...400

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.80...12.90

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.50...10.90
2nd pressure hPa : 440
Rack travel in m: 12.50...12.60
3rd pressure hPa : 250
Rack travel in m: 11.10...11.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1000
Del.quantity cm³/ : 193.0...201.0
1000 s: (191.0...203.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 150.0...154.0
1000 s: (148.0...156.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.80
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 275.0...325.0
1000 s: (-)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225
Rack travel in mm : 4.50...4.70

Remarks:

:
Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO
diaphragm.

For comb. with letter index see
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania
on November 14, 1989

Start of delivery - engine: 15° before
TDC

Firing sequence of engine:
1-5-3-6-2-4.

Note remarks

Combination no. : 0 402 670 804

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

1st version

Control lever
position degrees: 20...28

Testing:

1st rack travel in: 15.50
Speed rpm : 750...755
2nd rack travel in: 4.00
Speed rpm : 775...788
4th rack travel in: 900
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 9...17
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.2
Speed rpm : 350
Rack travel in mm : 5.10...5.30

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 15.50
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 260.0...280.0
1000 s: (256.0...284.0)

Remarks:

:

Observe VDT-I-420/120

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 h
Edition : 22.3.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 402 736 633
Injection pump
Pump designation : PES6P110A720/3RS6001
Governor
Governor design. : RQV300/600...1050PA
409KR

Cust. part no. : *

Customer-spec. information
Customer : MACK

Engine : ETA 676

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 40...45

Overflow valve : 2 417 413 011

Inlet press., bar : 1.5

Opening
pressure, bar : 300...303

Test lines : 9 681 230 710

Outside diameter
x Wall thickness
x Length mm : 6.35X1.70X915.00

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.85
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.80...13.95

Del.quantity cm3/ : 17.25...17.45

100 s: (-)

Spread cm3 : 0.4

100 s: (-)

2nd speed rpm : 300
Rack travel in mm : 4.30...4.40
Del.quantity cm3/ : 1.50...2.50
100 s: (-)
Spread cm3 : 0.4

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1070
Rack travel in mm : 16.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1000
Del.quantity : 172.5...174.5
1000 : (169.5...177.5)

RATED SPEED

1st version
Control lever
position degrees: 60.5...65.5

Testing:
1st rack travel in: 12.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1190...1220
4th rack travel in: 1280
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 16...21

Testing:
Speed rpm : 250
Minimum rack travel: 9.80
Speed rpm : 400
Rack travel in mm : 3.80...5.20
Rack travel in mm : 2.00
Speed rpm : 680...740

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000
Rack travel in m: 13.85...13.95
2nd speed rpm : 800
Rack travel in m: 14.10...14.20
3rd speed rpm : 600
Rack travel in m: 14.75...14.85
4th speed rpm : 500
Rack travel in m: 14.35...14.45

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm3/ : 188.0...194.0
1000 s: (187.0...195.0)
Speed rpm : 600
Del.quantity cm3/ : 218.0...222.0
1000 s: (116.0...224.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 120.0...180.0
1000 s: (-)
Rack travel in mm : 11.50...11.60

LOW IDLE

Speed rpm : 300
Del.quantity cm3/ : 15.0...25.0
1000 s: (-)

Remarks:

:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 c
Edition : 02.05.90
Replaces : 31.10.89
Test oil : ISO-4113

Combination no. : 0 402 746 827

Injection pump
Pump designation : PES6P120A720RS7148
EP type number : 0 412 726 810
Governor
Governor design. : RQV325...875PA848-7K
Governor no. : 0 421 815 176

Customer-spec. information
Customer : MACK TRUCKS INC.

Engine : EM6 300L 4VH

1st version kW : 224.0
Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 2 417 413 011

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness : 6.00X2.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 6.00...8.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 10.50
& maximum rack tra: 16.85
Difference ° CS : 4.70...5.90

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.10...11.20

Del.quantity cm³/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm³/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.20...1.40

2nd speed rpm : 450
travel mm : 2.50...2.80

3rd speed rpm : 600
travel mm : 4.10...4.30

4th speed rpm : 875
travel mm : 6.90...7.10

5th speed rpm : 1000
travel mm : 8.20...8.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 875
Aneroid pressure h: 1200
Del.quantity : 199.0...201.0
1000 : (196.0...204.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 55...63

Testing:

1st rack travel in: 10.10
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1000...1030
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 7...15
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 4.8

Testing:

Speed rpm : 275
Minimum rack travel: 6.20
Speed rpm : 325
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.10...11.20
2nd speed rpm : 510
Rack travel in m: 16.50...16.70
3rd speed rpm : 700
Rack travel in m: 13.30...13.50
4th speed rpm : 600
Rack travel in m: 15.40...15.60
5th speed rpm : 450
Rack travel in m: < 16.60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 1200

C08

Rack travel mm : 16.50...16.70

Measurement

Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 370
Rack travel in m: 10.70...10.80
3rd pressure hPa : 710
Rack travel in m: 14.60...15.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 299.0...305.0
1000 s: (296.0...308.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 152.5...156.5
1000 s: (150.5...158.5)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 10.10
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (135.0...165.0)
Rack travel in mm : 8.50...8.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.70...4.90
Del.quantity cm³/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5174-P2

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI 9,5 e
Edition : 16.02.90
Replaces : 24.2.89
Test oil : ISO-4113

Combination no. : 0 402 746 834

Injection pump
Pump designation : PES6P120A720RS7154
EP type number : 0 412 726 811
Governor
Governor design. : RQV275...1100PA888K
Governor no. : 0 421 815 191

Customer-spec. information
Customer : IVECO-UNIC

Engine : 8460.41.102

1st version kW : 235.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 105

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
: (4.95...5.15)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.60...11.70

Del.quantity cm³/ : 19.8...20.0

100 s: (19.5...20.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 4.9...5.1

Del.quantity cm³/ : 2.0...2.6
100 s: (1.7...2.9)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275
travel mm : 1.20...1.40

2nd speed rpm : 450
travel mm : 3.00...3.80

3rd speed rpm : 800
travel mm : 6.20...6.60

4th speed rpm : 1100
travel mm : 9.70...9.90

5th speed rpm : 1200
travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 198.0...200.0
1000 : (195.0...203.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control Lever
position degrees: 63...71

Testing:

1st rack travel in: 10.60
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1200...1230
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever
position degrees: 13...21

Testing:

Speed rpm : 100
Minimum rack travel: 6.50
Speed rpm : 275
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 280...400

TORQUE CONTROL

Dimension a mm : 0.80
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 12.00...12.10
2nd speed rpm : 1100
Rack travel in m: 11.60...11.70
3rd speed rpm : 950
Rack travel in m: 11.80...12.10
4th speed rpm : 750
Rack travel in m: 11.80...12.10
5th speed rpm : 400
Rack travel in m: 11.20...11.60

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 850
Pressure hPa : 1200
Rack travel mm : 12.00...12.10

Measurement

Speed 1/min : 850

1st pressure hPa : -

Rack travel in m: 9.00...9.40
2nd pressure hPa : 515
Rack travel in m: 11.30...11.40
3rd pressure hPa : 305
Rack travel in m: 9.50...9.70

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 850
Del.quantity cm3/ : 212.0...218.0
1000 s: (209.0...221.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 127.0...129.0
1000 s: (124.0...132.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.60
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 120.0...150.0
1000 s: (116.0...154.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D 2
Edition : 23.04.90
Replaces : 20.05.88
Test oil : ISO-4113

Combination no. : 0 403 436 103

Injection pump
Pump designation : PES6MW100/120RS1143
EP type number : 0 413 406 137
Governor
Governor design. : RQV350...1100MW82
Governor no. : 0 420 083 130

Customer-spec. information
Customer : CUMMINS/US

Engine : 6 CTA-830

1st version kW : 186.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15
: (3.00...3.20)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 15.0...15.2

100 s: (14.8...15.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.2...7.3

Del.quantity cm3/ : 1.6...2.0

100 s: (1.4...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1240

travel mm : 8.80...9.20

2nd speed rpm : 1140

travel mm : 7.80...8.00

3rd speed rpm : 700

travel mm : 3.80...4.40

4th speed rpm : 350

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 150.0...152.0

1000 : (148.0...154.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 44...52

Testing:
1st rack travel in: 11.70
Speed rpm : 1150...1160
2nd rack travel in: 4.00
Speed rpm : 1240...1270
4th rack travel in: 1330
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 13...21
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.2

Testing:
Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 7.20...7.30

CONSTANT REGULATION
Speed rpm : 360...500

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.70...12.80
2nd speed rpm : 700
Rack travel in m: 13.40...13.50
3rd speed rpm : 900
Rack travel in m: 12.90...13.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.90...10.10

Measurement
Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 10.80...10.90
2nd pressure hPa : 520
Rack travel in m: 12.20...12.50
3rd pressure hPa : 900
Rack travel in m: 13.60...13.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm³/ : 159.0...161.0
1000 s: (157.0...163.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 88.0...90.0
1000 s: (86.0...92.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.70
Speed rpm : 1150...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 205.0...225.0
1000 s: (202.0...228.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.20...7.30
Del.quantity cm³/ : 16.0...20.0
1000 s: (14.0...22.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

Start-of-delivery mark/lock = 8.0°
angular displacement of the cam after
start of delivery of cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D 3
 Edition : 23.04.90
 Replaces : 07.07.89
 Test oil : ISO-4113
 Combination no. : 0 403 436 104
 Injection pump
 Pump designation : PES6MW100/120RS1143
 EP type number : 0 413 406 137
 Governor
 Governor design. : RQV350...1200MW82-1
 Governor no. : 0 420 083 153

Customer-spec. information
 Customer : CUMMINS/US

Engine : 6 CTA-830

1st version kw : 179.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.15...3.25
 : (3.10...3.30)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 13.6...13.8

100 s: (13.4...14.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.1...7.2

Del.quantity cm3/ : 1.2...1.6

100 s: (1.0...1.8)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 7.60...7.80

2nd speed rpm : 1350

travel mm : 8.60...9.00

3rd speed rpm : 350

travel mm : 1.20...1.60

4th speed rpm : 800

travel mm : 4.90...5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 136.0...138.0

1000 : (134.0...140.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 42...50

Testing:

1st rack travel in: 11.00
Speed rpm : 1250...1260
2nd rack travel in: 4.00
Speed rpm : 1375...1405
4th rack travel in: 1455
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 11...19
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.1

Testing:

Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 7.10...7.20

CONSTANT REGULATION

Speed rpm : 360...500

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200
Rack travel in m: 12.00...12.10
2nd speed rpm : 750
Rack travel in m: 12.50...12.60
3rd speed rpm : 1000
Rack travel in m: 12.00...12.10
4th speed rpm : 900
Rack travel in m: 12.10...12.30

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.00...11.10

Measurement

Speed 1/min : 500

1st pressure hPa : 390
Rack travel in m: 11.40...11.50
2nd pressure hPa : 480
Rack travel in m: 11.90...12.20
3rd pressure hPa : 700
Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 750
Del.quantity cm³/ : 138.5...140.5
1000 s: (135.5...143.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 108.0...110.0
1000 s: (106.0...112.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00

Speed rpm : 1250...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 205.0...225.0
1000 s: (202.0...228.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.10...7.20
Del.quantity cm³/ : 12.0...16.0
1000 s: (10.0...18.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

Start-of-delivery mark at 10° cam
rotation angle after start of delivery,
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 F 1
Edition : 23.04.90
Replaces : 10.02.90
Test oil : ISO-4113

Combination no. : 0 403 436 105

Injection pump
Pump designation : PES6MW100/120RS1169
EP type number : 0 413 406 153
Governor
Governor design. : RQV350...1200MW78-1
Governor no. : 0 420 083 156

Customer-spec. information
Customer : CDC

Engine : 6CTA830

1st version kW : 197.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
: (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.90...12.00

Del.quantity cm3/ : 14.1...14.3

100 s: (13.9...14.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.6...2.0

100 s: (1.4...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.60...9.00

2nd speed rpm : 1250

travel mm : 7.60...7.80

3rd speed rpm : 800

travel mm : 4.90...5.50

4th speed rpm : 350

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 600

Del.quantity : 141.0...143.0

1000 : (139.0...145.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 10.90

Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1385...1415
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 10...18
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.7

Testing:

Speed rpm : 100
Minimum rack travel: 7.50
Speed rpm : 350
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

Speed rpm : 370...500

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 300
Rack travel mm : 11.00...11.10

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.70...10.80
2nd pressure hPa : 375
Rack travel in m: 11.50...11.80
3rd pressure hPa : 600
Rack travel in m: 11.90...12.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 600
Speed rpm : 750
Del.quantity cm³/ : 137.5...141.5
1000 s: (135.0...143.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 113.5...115.5
1000 s: (111.5...117.5)

Spread cm³ : 3.50
1000 s: (6.00)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.90
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 218.0...228.0
1000 s: (215.0...231.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ : 16.0...20.0
1000 s: (14.0...22.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark 10.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D 5
Edition : 19.03.90
Replaces : 24.10.88
Test oil : ISO-4113

Combination no. : 0 403 436 106

Injection pump
Pump designation : PES6MW100/120RS1143
EP type number : 0 413 406 137
Governor
Governor design. : RGV350...1100MW78-2
Governor no. : 0 420 083 160

Cust. part no. : 3915907

Customer-spec. information
Customer : CUMMINS/US

Engine : 6 CTA-8.3

1st version kW : 179.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15
: (3.00...3.20)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing :
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm³/ : 15.0...15.2

100 s: (14.8...15.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.3...7.5

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1210

travel mm : 9.00...9.40

2nd speed rpm : 1100

travel mm : 7.90...8.10

3rd speed rpm : 550

travel mm : 3.00...3.60

4th speed rpm : 350

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 150.0...152.0

1000 : (148.0...154.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 44...52

Testing:
1st rack travel in: 11.70
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1230...1260
4th rack travel in: 1330
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 13...21
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.4

Testing:
Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 7.30...7.50

CONSTANT REGULATION
Speed rpm : 360...550

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.60...9.70

Measurement
Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 10.80...10.90
2nd pressure hPa : 520
Rack travel in m: 11.90...12.20
3rd pressure hPa : 900
Rack travel in m: 12.70...12.80

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 76.0...78.0
1000 s: (74.0...80.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.70
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 205.0...225.0
1000 s: (202.0...228.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.30...7.50
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: C.D.C. # 3915907
Start-of-delivery mark/lock = 8.0°
angular displacement of the cam after
start of delivery of cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D13
Edition : 19.03.90
Replaces : 07.02.89
Test oil : ISO-4113

Combination no. : 0 403 436 106

Injection pump
Pump designation : PES6MW100/120RS1143
EP type number : 0 413 406 137
Governor
Governor design. : RQV350...1100MW78-2
Governor no. : 0 420 083 160

Cust. part no. : 3908567

Customer-spec. information
Customer : CUMMINS/US

Engine : 6 CTA-8.3

1st version kW : 179.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15
: (3.00...3.20)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100
Rack travel in mm : 12.70...12.80
Del.quantity cm3/ : 15.0...15.2
100 s: (14.8...15.4)
Spread cm3 : 0.3
100 s: (0.6)

2nd speed rpm : 350.0
Rack travel in mm : 7.3...7.5
Del.quantity cm3/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm3 : 0.3
100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1240
travel mm : 8.80...9.20
2nd speed rpm : 1140
travel mm : 7.80...8.00
3rd speed rpm : 700
travel mm : 3.80...4.40
4th speed rpm : 350
travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1100
Aneroid pressure h: 900
Del.quantity : 150.0...152.0
1000 : (148.0...154.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 44...52

Testing:
1st rack travel in: 11.70
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1230...1260
4th rack travel in: 1330
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 13...21
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.4

Testing:
Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 7.30...7.50

CONSTANT REGULATION
Speed rpm : 360...550

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.60...9.70

Measurement
Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 10.80...10.90
2nd pressure hPa : 520
Rack travel in m: 11.90...12.20
3rd pressure hPa : 900
Rack travel in m: 12.70...12.80

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 76.0...78.0
1000 s: (74.0...80.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.70
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 205.0...225.0
1000 s: (202.0...228.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.30...7.50
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: C.D.C. # 3908567
Start-of-delivery mark/lock = 8.0°
angular displacement of the cam after
start of delivery of cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D 4
Edition : 23.04.90
Replaces : 30.09.88
Test oil : ISO-4113

Combination no. : 0 403 436 107

Injection pump
Pump designation : PES6MW100/12ORS1143
EP type number : 0 413 406 137
Governor
Governor design. : RQV350...1100MW82-2
Governor no. : 0 420 083 161

Cust. part no. : 3915168

Customer-spec. information
Customer : CUMMINS/US

Engine : 6 CTA

1st version kW : 186.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test Lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15
(3.00...3.20)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100
Rack travel in mm : 12.80...12.90
Del.quantity cm³/ : 15.2...15.4
100 s: (15.0...15.6)
Spread cm³ : 0.3
100 s: (0.6)

2nd speed rpm : 350.0
Rack travel in mm : 7.2...7.4
Del.quantity cm³/ : 1.6...2.0
100 s: (1.4...2.2)
Spread cm³ : 0.3
100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250
travel mm : 9.00...9.40
2nd speed rpm : 1140
travel mm : 7.80...8.00
3rd speed rpm : 700
travel mm : 3.80...4.40
4th speed rpm : 350
travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1100
Aneroid pressure h: 900
Del.quantity : 152.0...154.0
1000 : (150.0...156.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 42...50

Testing:
1st rack travel in: 11.80
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1235...1265
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 12...20
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.3

Testing:
Speed rpm : 100
Minimum rack travel: 8.80
Speed rpm : 350
Rack travel in mm : 7.20...7.40

CONSTANT REGULATION
Speed rpm : 360...500

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.80...12.90
2nd speed rpm : 700
Rack travel in m: 13.50...13.60
3rd speed rpm : 900
Rack travel in m: 12.90...13.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.50...9.70

Measurement
Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 10.80...10.90
2nd pressure hPa : 570
Rack travel in m: 12.30...12.60
3rd pressure hPa : 900
Rack travel in m: 13.50...13.60

START CUT-OUT

Speed 1/min : 270 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm3/ : 160.5...163.5
1000 s: (158.0...166.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 77.0...79.0
1000 s: (75.0...81.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.80
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 205.0...225.0
1000 s: (202.0...228.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.20...7.40
Del.quantity cm3/ : 16.0...20.0
1000 s: (14.0...22.0)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:
: C.D.C #3915168

Start-of-delivery mark/lock = 8.0°
angular displacement of the cam after
start of delivery of cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D 9
Edition : 23.04.90
Replaces : 10.02.89
Test oil : ISO-4113

Combination no. : 0 403 436 108

Injection pump
Pump designation : PES6MW100/120RS1143
EP type number : 0 413 406 137
Governor
Governor design. : RQV350...1100MW82-3
Governor no. : 0 420 083 162

Cust. part no. : 3914125

Customer-spec. information
Customer : CUMMINS/US

Engine : 6 CTA-830

1st version kW : 186.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15
: (3.00...3.20)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.40...12.50

Del.quantity cm³/ : 14.8...15.0

100 s: (14.6...15.2)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.2...7.4

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1240

travel mm : 8.80...9.20

2nd speed rpm : 1140

travel mm : 7.80...8.00

3rd speed rpm : 700

travel mm : 3.80...4.40

4th speed rpm : 350

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 148.0...150.0

1000 : (146.0...152.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 44...52

Testing:
1st rack travel in: 11.40
Speed rpm : 1150...1160
2nd rack travel in: 4.00
Speed rpm : 1235...1265
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 13...21
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.3

Testing:
Speed rpm : 100
Minimum rack travel: 9.30
Speed rpm : 350
Rack travel in mm : 7.20...7.40

CONSTANT REGULATION
Speed rpm : 360...500

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.40...12.50
2nd speed rpm : 700
Rack travel in m: 13.20...13.30
3rd speed rpm : 1050
Rack travel in m: 12.40...12.60
4th speed rpm : 900
Rack travel in m: 12.80...13.00

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.20...10.30

Measurement
Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 11.30...11.40
2nd pressure hPa : 520
Rack travel in m: 12.70...13.00
3rd pressure hPa : 900
Rack travel in m: 13.20...13.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm3/ : 159.0...161.0
1000 s: (157.0...163.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 103.0...106.0
1000 s: (101.5...107.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.40
Speed rpm : 1150...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 205.0...225.0
1000 s: (202.0...228.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.20...7.40
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks: : C.D.C. #3914125

Start-of-delivery mark 9° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D10
Edition : 23.04.90
Replaces : 28.04.89
Test oil : ISO-4113

Combination no. : 0 403 436 110

Injection pump
Pump designation : PES6MW100/120RS1143
EP type number : 0 413 406 137
Governor
Governor design. : RQV350...1100MW82-5
Governor no. : 0 420 083 177

Cust. part no. : 3913639

Customer-spec. information
Customer : CUMMINS/US

Engine : 6 CTA

1st version kW : 179.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test Lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15
: (3.00...3.20)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100
Rack travel in mm : 11.60...11.70
Del.quantity cm3/ : 13.5...13.7
100 s: (13.3...13.9)
Spread cm3 : 0.3
100 s: (0.6)

2nd speed rpm : 350.0
Rack travel in mm : 7.0...7.2
Del.quantity cm3/ : 1.6...2.0
100 s: (1.4...2.2)
Spread cm3 : 0.3
100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1240
travel mm : 8.80...9.20
2nd speed rpm : 1140
travel mm : 7.80...8.00
3rd speed rpm : 700
travel mm : 3.80...4.40
4th speed rpm : 350
travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1100
Aneroid pressure h: 900
Del.quantity : 135.0...137.0
1000 : (133.0...139.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 43...51

Testing:
1st rack travel in: 10.60
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1215...1245
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.1

Testing:
Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 7.00...7.20

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 11.60...11.70
2nd speed rpm : 700
Rack travel in m: 12.90...13.00
3rd speed rpm : 900
Rack travel in m: 12.40...12.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.00...10.10

Measurement
Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 11.10...11.20
2nd pressure hPa : 520
Rack travel in m: 12.30...12.60
3rd pressure hPa : 900
Rack travel in m: 12.90...13.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

C27

1st version
Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm3/ : 155.0...158.0
1000 s: (152.5...160.5)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 98.0...100.0
1000 s: (96.0...102.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.60
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 205.0...225.0
1000 s: (202.0...228.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.00...7.20
Del.quantity cm3/ : 16.0...20.0
1000 s: (14.0...22.0)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:
: C.D.C #3913639

Start-of-delivery mark 9° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D12
 Edition : 23.04.90
 Replaces : 02.10.89
 Test oil : ISO-4113
 Combination no. : 0 403 436 111
 Injection pump
 Pump designation : PES6MW100/120RS1143
 EP type number : 0 413 406 137
 Governor
 Governor design. : RQV350...1200MW82-6
 Governor no. : 0 420 083 184

Cust. part no. : 3916000

Customer-spec. information
 Customer : CUMMINS/US

Engine : 6 CTA-830
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.15...3.25
 : (3.10...3.30)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 13.8...14.0

100 s: (13.6...14.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.1...7.3

Del.quantity cm3/ : 1.2...1.6

100 s: (1.0...1.8)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 7.60...7.80

2nd speed rpm : 1350

travel mm : 8.60...9.00

3rd speed rpm : 350

travel mm : 1.20...1.60

4th speed rpm : 800

travel mm : 4.90...5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 138.0...140.0

1000 : (136.0...142.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 42...50

Testing:

1st rack travel in: 11.10
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1370...1400
4th rack travel in: 1455
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 11...19
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.2

Testing:

Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 7.10...7.30

CONSTANT REGULATION

Speed rpm : 360...500

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200
Rack travel in m: 12.10...12.20
2nd speed rpm : 750
Rack travel in m: 12.50...12.60
3rd speed rpm : 1000
Rack travel in m: 12.10...12.20
4th speed rpm : 900
Rack travel in m: 12.20...12.40

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.00...11.10

Measurement

Speed 1/min : 500

1st pressure hPa : 390
Rack travel in m: 11.40...11.50
2nd pressure hPa : 480
Rack travel in m: 11.90...12.20
3rd pressure hPa : 700
Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 750
Del.quantity cm³/ : 139.0...142.0
1000 s: (136.5...144.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 108.0...110.0
1000 s: (106.0...112.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 205.0...225.0
1000 s: (202.0...228.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.10...7.30
Del.quantity cm³/ : 12.0...16.0
1000 s: (10.0...18.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: C.D.C #3916000

Start-of-delivery mark at 10° cam
rotation angle after start of delivery,
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 D14
 Edition : 02.05.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 436 112
 Injection pump
 Pump designation : PES6MW100/120RS1143
 EP type number : 0 413 406 137
 Governor
 Governor design. : RQV350...1200MW78-3
 Governor no. : 0 420 083 213

Customer-spec. information
 Customer : CUMMINS

Engine : 6 CTA

1st version kW : 179.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15
 : (3.00...3.20)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.70...11.80

Del.quantity cm3/ : 14.5...14.7

100 s: (14.3...14.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.2

Del.quantity cm3/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1400
 travel mm : 7.50...7.90

2nd speed rpm : 1200
 travel mm : 6.40...6.60

3rd speed rpm : 600
 travel mm : 3.20...3.80

4th speed rpm : 350
 travel mm : 1.40...1.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1200
 Aneroid pressure h: 900
 Del.quantity : 145.0...147.0
 1000 : (143.0...149.0)
 Spread cm3 : 3.50
 1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 39...47

Testing:
1st rack travel in: 10.70
Speed rpm : 1265...1275
2nd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.1

Testing:
Speed rpm : 100
Minimum rack travel: 6.50
Speed rpm : 350
Rack travel in mm : 5.00...5.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.90...9.00

Measurement
Speed 1/min : 500

1st pressure hPa : 265
Rack travel in m: 9.70...9.80
2nd pressure hPa : 505
Rack travel in m: 10.90...11.20
3rd pressure hPa : 900
Rack travel in m: 11.70...11.80

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 76.0...78.0
1000 s: (74.0...80.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.70
Speed rpm : 1265...1275

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 205.0...225.0
1000 s: (202.0...228.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.00...5.20
Del.quantity cm3/ : 11.0...15.0
1000 s: (8.5...17.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark/lock = 8.0°
angular displacement of the cam after
start of delivery of cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 G
Edition : 23.04.90
Replaces : -
Test oil : ISO-4113

Combination no. : 0 403 444 116

Injection pump
Pump designation : PES4MW100/72ORS1127-
2
EP type number : 0 413 404 111
Governor
Governor design. : RQV300...1400MW48-7
Governor no. : 0 420 083 172

Customer-spec. information
Customer : MB-NFZ

Engine : OM 364A

1st version kW : 70.0
Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)

Rack travel in mm : 9.00...12.00
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 10.00...10.10

Del.quantity cm3/ : 6.7...6.9

100 s: (6.5...7.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.9...8.1

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1550

travel mm : 9.00...9.40

2nd speed rpm : 1450

travel mm : 8.20...8.40

3rd speed rpm : 550

travel mm : 2.80...3.40

4th speed rpm : 300

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 67.0...69.0

1000 : (65.0...71.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 48...56

Testing:
1st rack travel in: 9.50
Speed rpm : 1450...1460
2nd rack travel in: 4.00
Speed rpm : 1540...1570
4th rack travel in: 1650
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 18...26
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 8.0

Testing:
Speed rpm : 100
Minimum rack travel: 9.50
Speed rpm : 300
Rack travel in mm : 7.90...8.10

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1400
Rack travel in m: 10.00...10.10
2nd speed rpm : 750
Rack travel in m: 10.80...10.90
3rd speed rpm : 950
Rack travel in m: 10.60...10.90
4th speed rpm : 1100
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 750
Del.quantity cm³/ : 60.0...62.0
1000 s: (57.0...65.0)
Spread cm³ : 5.00
1000 s: (7.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.50
Speed rpm : 1450...1460

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.90...8.10
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 G 1
Edition : 02.05.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 403 444 117
Injection pump
Pump designation : PES4MW100/72ORS1127-
2
EP type number : 0 413 404 111
Governor
Governor design. : RQV300...1400MW48-10
Governor no. : 0 420 083 178

Customer-spec. information
Customer : MB-NFZ

Engine : OM 364A

1st version kW : 85.0
Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
: (3.45...3.65)

Rack travel in mm : 9.00...12.00
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 11.50...11.60

Del.quantity cm³/ : 7.9...8.1

100 s: (7.7...8.3)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.9...9.1

Del.quantity cm³/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1550

travel mm : 9.00...9.40

2nd speed rpm : 1450

travel mm : 8.30...8.50

3rd speed rpm : 550

travel mm : 2.80...3.40

4th speed rpm : 300

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 79.0...81.0

1000 : (77.0...83.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 48...56

Testing:
1st rack travel in: 10.50
Speed rpm : 1440...1450
2nd rack travel in: 4.00
Speed rpm : 1540...1570
4th rack travel in: 1650
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 18...26
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 9.0

Testing:
Speed rpm : 100
Minimum rack travel: 10.50
Speed rpm : 300
Rack travel in mm : 8.90...9.10

TORQUE CONTROL
Dimension a mm : 1.30
Torque control curve - 1st version
1st speed rpm : 1400
Rack travel in m: 11.50...11.60
2nd speed rpm : 750
Rack travel in m: 12.80...12.90
3rd speed rpm : 950
Rack travel in m: 12.40...12.60
4th speed rpm : 1100
Rack travel in m: 12.00...12.30

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 750
Del.quantity cm³/ : 75.0...77.0
1000 s: (73.0...79.0)
Spread cm³ : 5.00
1000 s: (7.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.50
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 8.90...9.10
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 88
Edition : 04.05.90
Replaces : -
Test oil : ISO-4113

Combination no. : 0 403 446 184A

Injection pump
Pump designation : PES6MW100/720RS1144
EP type number : 0 413 406 138
Governor
Governor design. : RQV300...1300MW48-3
Governor no. : 0 420 083 121

Customer-spec. information
Customer : MB-NFZ

Engine : OM366C

1st version kW : 100.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 9.40...9.50

Del.quantity cm³/ : 5.4...5.6

100 s: (5.2...5.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...7.9

Del.quantity cm³/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1340

travel mm : 8.50...8.70

2nd speed rpm : 1450

travel mm : 9.30...9.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Del.quantity : 54.0...56.0

1000 : (52.0...58.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control Lever
position degrees: 50...58

Testing:

1st rack travel in: 8.40
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever
position degrees: 18...26
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 7.8

Testing:

Speed rpm : 100
Minimum rack travel: 9.30
Speed rpm : 300
Rack travel in mm : 7.80...7.90

CONSTANT REGULATION

Speed rpm : 330...500

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300
Rack travel in m: 9.40...9.50
2nd speed rpm : 500
Rack travel in m: 10.10...10.20
3rd speed rpm : 1020
Rack travel in m: 9.70...9.90

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm3/ : 31.0...34.0
1000 s: (28.5...36.5)
Spread cm3 : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.40
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

D09

Speed rpm : 100
Del.quantity cm3/ : 78.0...88.0
1000 s: (75.0...91.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.80...7.90
Del.quantity cm3/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 28
Edition : 19.03.90
Replaces : 19.08.88
Test oil : ISO-4113

Combination no. : 0 403 446 188

Injection pump
Pump designation : PES6MW100/720RS1144
EP type number : 0 413 406 138
Governor
Governor design. : RQV300...1300MW48-4
Governor no. : 0 420 083 126

Customer-spec. information
Customer : DB

Engine : OM366A

1st version kW : 100.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.00...10.10

Del.quantity cm³/ : 6.2...6.4

100 s: (6.0...6.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.3...7.4

Del.quantity cm³/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1340

travel mm : 8.50...8.70

2nd speed rpm : 1450

travel mm : 9.30...9.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Del.quantity : 62.0...64.0

1000 : (60.0...66.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 50...58

Testing:

1st rack travel in: 9.00
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1415...1445
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 18...26
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 7.3

Testing:

Speed rpm : 100
Minimum rack travel: 9.30
Speed rpm : 300
Rack travel in mm : 7.30...7.40

CONSTANT REGULATION

Speed rpm : 330...500

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300
Rack travel in m: 10.00...10.10
2nd speed rpm : 700
Rack travel in m: 11.00...11.10
3rd speed rpm : 600
Rack travel in m: 11.00...11.10
4th speed rpm : 1000
Rack travel in m: 10.60...10.90

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm³/ : 59.5...62.5
1000 s: (57.0...65.0)
Spread cm³ : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.00
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.30...7.40
Del.quantity cm³/ : 9.0...13.0
1000 s: (7.0...15.0)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 85
 Edition : 07.02.89
 Replaces :
 Test oil : ISO-4113
 Combination no. : 0 403 446 191
 Injection pump
 Pump designation : PES6MW100/72ORS1144
 EP type number : 0 413 406 138
 Governor
 Governor design. : RQV300...1200MW48-5
 Governor no. : 0 420 083 140

Customer-spec. information
 Customer : DAIMLER-BENZ

Engine : OM366A

1st version kW : 116.0
 Rated speed : 2400
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness : 6.00x1.50x600
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del.quantity cm³/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.0...8.1

Del.quantity cm³/ : 1.0...1.4

100 s: (0.9...1.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 7.30...7.50

2nd speed rpm : 1380

travel mm : 8.50...8.90

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1330

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 77.0...79.0

1000 : (75.0...81.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 46...54

Testing:
1st rack travel in: 9.80
Speed rpm : 1250...1260
2nd rack travel in: 4.00
Speed rpm : 1350...1380
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 16...24

Testing:
Speed rpm : 100
Minimum rack trave: 9.80
Speed rpm : 300
Rack travel in mm : 8.00...8.10

CONSTANT REGULATION
Speed rpm : 330...500

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 10.80...10.90
2nd speed rpm : 700
Rack travel in m: 11.10...11.20
3rd speed rpm : 800
Rack travel in m: 10.90...11.10

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 700
Del.quantity cm3/ : 62.0...64.0
1000 s: (60.0...66.0)
Spread cm3 : 5.00
1000 s: (7.00)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 1250...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 80.0...90.0
1000 s: (77.0...93.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 8.00...8.10
Del.quantity cm3/ : 10.0...14.0
1000 s: (9.0...15.0)
Spread cm3 : 3.50
1000 s: (5.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 8,8 S 1
Edition : 12.04.90
Replaces : 02.01.90
Test oil : ISO-4113

Combination no. : 0 403 446 209

Injection pump
Pump designation : PES6MW100/32ORS1171
EP type number : 0 413 406 156
Governor
Governor design. : RQV300...1300MW80-1
Governor no. : 0 420 083 159

Customer-spec. information
Customer : RVI

Engine : MIDS060212B

1st version kW : 113.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 033

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
: (2.95...3.15)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.2...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1500

travel mm : 8.70...9.10

2nd speed rpm : 1350

travel mm : 7.60...7.80

3rd speed rpm : 500

travel mm : 2.80...3.40

4th speed rpm : 300

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 60...68

Testing:

1st rack travel in: 9.80

Speed rpm : 1390...1400
2nd rack travel in: 4.00
Speed rpm : 1540...1570
4th rack travel in: 1700
Speed rpm : 0.0...1.00

LOW IDLE 1

Control lever
position degrees: 10...18
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.4

Testing:

Speed rpm : 200
Minimum rack travel: 7.00
Speed rpm : 300
Rack travel in mm : 5.20...5.60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.80...9.00

Measurement

Speed 1/min : 500

1st pressure hPa : 100
Rack travel in m: 9.30...9.40
2nd pressure hPa : 200
Rack travel in m: 10.20...10.30
3rd pressure hPa : 700
Rack travel in m: 10.80...10.90

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 900
Del.quantity cm3/ : 81.0...84.0
1000 s: (78.5...86.5)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 43.0...45.0
1000 s: (41.0...47.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 1390...1400

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 90.0...110.0
1000 s: (87.0...113.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.20...5.60
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

Start-of-delivery mark made with
prestroke 3.00...3.10 mm at barrel 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 8,8 S 2
Edition : 12.04.90
Replaces : 01.02.90
Test oil : ISO-4113

Combination no. : 0 403 446 220

Injection pump
Pump designation : PES6MW100/32ORS1171
EP type number : 0 413 406 156
Governor
Governor design. : RQV300...1400MW80-3
Governor no. : 0 420 083 183

Customer-spec. information
Customer : RVI

Engine : MIDR 06.02.120

1st version kW : 134.0
Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 033

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 173...176

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
: (2.95...3.15)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 11.10...11.20

Del.quantity cm³/ : 9.2...9.4

100 s: (9.0...9.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.10...5.50

Del.quantity cm³/ : 1.5...1.9

100 s: (1.2...2.1)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1590

travel mm : 9.50...9.90

2nd speed rpm : 1450

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.80...3.40

4th speed rpm : 300

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Aneroid pressure h: 750

Del.quantity : 92.0...94.0

1000 : (90.0...96.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 63...71

Testing:

1st rack travel in: 10.10

Speed rpm : 1470...1480
2nd rack travel in: 4.00
Speed rpm : 1610...1640
4th rack travel in: 1700
Speed rpm : 0.0...1.00

LOW IDLE 1

Control lever
position degrees: 12...20
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.8

Testing:

Speed rpm : 200
Minimum rack travel: 7.00
Speed rpm : 300
Rack travel in mm : 5.10...5.50

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.60...8.70

Measurement

Speed 1/min : 500

1st pressure hPa : 80
Rack travel in m: 9.00...9.10
2nd pressure hPa : 200
Rack travel in m: 10.30...10.60
3rd pressure hPa : 750
Rack travel in m: 11.10...11.20

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 750
Speed rpm : 900
Del.quantity cm3/ : 86.5...89.5
1000 s: (84.0...92.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 42.0...44.0
1000 s: (40.0...46.0)

BREAKAWAY

D17

1st version
1mm rack travel less than

full load rack tr: 10.10
Speed rpm : 1470...1480

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 95.0...115.0
1000 s: (92.0...118.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.10...5.50
Del.quantity cm3/ : 15.0...19.0
1000 s: (12.5...21.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

Start-of-delivery mark made with
prestroke 3.00...3.10 mm at barrel 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 8,8 S 3
Edition : 02.05.90
Replaces : 02.01.90
Test oil : ISO-4113

Combination no. : 0 403 446 235

Injection pump
Pump designation : PES6MW100/320RS1171
EP type number : 0 413 406 156
Governor
Governor design. : RQV300...1300MW80-5
Governor no. : 0 420 083 197

Customer-spec. information
Customer : RVI

Engine : MIDS 060212B

1st version kW : 113.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 033

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
: (2.95...3.15)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.20...5.60

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1500

travel mm : 8.70...9.10

2nd speed rpm : 1350

travel mm : 7.60...7.80

3rd speed rpm : 500

travel mm : 2.80...3.40

4th speed rpm : 300

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 60...68

Testing:

1st rack travel in: 9.80

Speed rpm : 1390...1400
2nd rack travel in: 4.00
Speed rpm : 1505...1535
4th rack travel in: 1700
Speed rpm : 0.0...1.00

LOW IDLE 1

Control lever
position degrees: 10...18
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.4

Testing:

Speed rpm : 200
Minimum rack travel: 7.00
Speed rpm : 300
Rack travel in mm : 5.20...5.60

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.80...9.00

Measurement

Speed 1/min : 500

1st pressure hPa : 100
Rack travel in m: 9.30...9.40
2nd pressure hPa : 200
Rack travel in m: 10.20...10.50
3rd pressure hPa : 700
Rack travel in m: 10.80...10.90

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 900
Del.quantity cm3/ : 81.0...84.0
1000 s: (78.5...86.5)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 43.0...45.0
1000 s: (41.0...47.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 1390...1400

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 90.0...110.0
1000 s: (87.0...113.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.20...5.60
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

Start-of-delivery mark made with
prestroke 3.00...3.10 mm at barrel 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : AIF 5,9 A
Edition : 12.04.90
Replaces : 02.01.90
Test oil : ISO-4113

Combination no. : 0 403 446 238

Injection pump
Pump designation : PES6MW100/72ORS1188
EP type number : 0 413 406 175
Governor
Governor design. : RQV300...1350MW106
Governor no. : 0 420 083 200

Customer-spec. information
Customer : AIFO

Engine : 8061.25.051

1st version kW : 210.0

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
: (2.95...3.15)

Rack travel in mm : 11.50...14.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 10.90...11.00

Del.quantity cm³/ : 12.8...13.0

100 s: (12.6...13.2)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm³/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1530

travel mm : 9.00...9.20

2nd speed rpm : 1400

travel mm : 7.80...8.20

3rd speed rpm : 600

travel mm : 2.90...3.50

4th speed rpm : 300

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Del.quantity : 128.0...130.0

1000 : (126.0...132.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 118...126

Testing:

1st rack travel in: 9.90
Speed rpm : 1400...1410
2nd rack travel in: 4.00
Speed rpm : 1515...1545
4th rack travel in: 1650
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 84...92
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.0

Testing:

Speed rpm : 200
Minimum rack travel: 7.50
Speed rpm : 300
Rack travel in mm : 5.90...6.10

TORQUE CONTROL

Dimension a mm : 0.80
Torque control curve - 1st version
1st speed rpm : 1350
Rack travel in m: 10.90...11.00
2nd speed rpm : 800
Rack travel in m: 11.70...11.80
3rd speed rpm : 1100
Rack travel in m: 11.30...11.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm3/ : 137.0...140.0
1000 s: (134.5...142.5)
Spread cm3 : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1400...1410

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 100.0...120.0
1000 s: (97.0...123.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.90...6.10
Del.quantity cm3/ : 11.0...15.0
1000 s: (8.5...17.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 6,1 V
Edition : 02.05.90
Replaces : 16.02.90
Test oil : ISO-4113

Combination no. : 0 403 446 247

Injection pump
Pump designation : PES6MW100/720RS1195
EP type number : 0 413 406 183
Governor
Governor design. : RQV300...1150MW107
Governor no. : 0 420 083 208

Customer-spec. information
Customer : KHD

Engine : BF 6L 913 C

1st version kW : 101.0
Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10
: (3.95...4.15)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.70...9.80

Del.quantity cm³/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.5...7.7

Del.quantity cm³/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200
travel mm : 9.80...10.20

2nd speed rpm : 800
travel mm : 6.00...6.20

3rd speed rpm : 500
travel mm : 3.20...3.80

4th speed rpm : 300
travel mm : 2.20...2.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1050

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1000

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 40...48

Testing:
1st rack travel in: 8.70
Speed rpm : 1180...1190
2nd rack travel in: 4.00
Speed rpm : 1230...1260
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 13...21
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 7.6

Testing:
Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 300
Rack travel in mm : 7.50...7.70
Rack travel in mm : 2.00
Speed rpm : 420...480

TORQUE CONTROL
Dimension a mm : 0.75
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 9.70...9.80
2nd speed rpm : 800
Rack travel in m: 10.30...10.50
3rd speed rpm : 1030
Rack travel in m: 10.00...10.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.00...10.20

Measurement
Speed 1/min : 500
2nd pressure hPa : 450
Rack travel in m: 10.20...10.30
3rd pressure hPa : 1000
Rack travel in m: 10.30...10.50

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 800
Del.quantity cm3/ : 86.0...89.0
1000 s: (83.5...91.5)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 69.0...71.0
1000 s: (67.0...73.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 8.70
Speed rpm : 1180...1190

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 110.0...130.0
1000 s: (107.0...133.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.50...7.70
Del.quantity cm3/ : 13.0...17.0
1000 s: (10.5...19.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

Test electrically-released starting
quantity (EES) with 12 volts

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 84
 Edition : 30.03.90
 Replaces : 05.03.90
 Test oil : ISO-4113
 Combination no. : 0 403 446 248
 Injection pump
 Pump designation : PES6MW100/720RS1144
 EP type number : 0 413 406 138
 Governor
 Governor design. : RQV300...1400MW48-12
 Governor no. : 0 420 083 212

Customer-spec. information
 Customer : MB-NFZ

Engine : OM366C

1st version kW : 100.0
 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.90...10.00

Del.quantity cm³/ : 5.9...6.1

100 s: (5.7...6.3)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.0...8.2

Del.quantity cm³/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1550

travel mm : 9.20...9.60

2nd speed rpm : 1450

travel mm : 8.30...8.50

3rd speed rpm : 550

travel mm : 2.80...3.40

4th speed rpm : 300

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1470

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 59.0...61.0

1000 : (57.0...63.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 108...116

Testing:
1st rack travel in: 8.90
Speed rpm : 1440...1450
2nd rack travel in: 4.00
Speed rpm : 1530...1560
4th rack travel in: 1650
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 76...82
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 8.1

Testing:
Speed rpm : 100
Minimum rack travel: 9.50
Speed rpm : 300
Rack travel in mm : 8.00...8.20

TORQUE CONTROL
Dimension a mm : 0.50
Torque control curve - 1st version
1st speed rpm : 1400
Rack travel in m: 9.90...10.00
2nd speed rpm : 800
Rack travel in m: 10.40...10.50
3rd speed rpm : 1050
Rack travel in m: 10.10...10.30

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 800
Del.quantity cm3/ : 52.5...55.5
1000 s: (50.0...58.0)
Spread cm3 : 5.00
1000 s: (7.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 8.90
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 8.00...8.20
Del.quantity cm3/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,2 W
Edition : 02.05.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 403 456 109
Injection pump
Pump designation : PES6MW100/321RS1200
EP type number : 0 413 406 189
Governor
Governor design. : RQV250...1200MW83-2
Governor no. : 0 420 083 216

Cust. part no. : 3-7036

Customer-spec. information
Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
: (3.45...3.65)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 4.8...5.0

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250
travel mm : 10.50...10.60

2nd speed rpm : 810
travel mm : 5.90...6.10

3rd speed rpm : 500
travel mm : 3.70...4.30

4th speed rpm : 250
travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1075

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)

Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 58...66

Testing:
1st rack travel in: 11.50
Speed rpm : 1245...1260
2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 13...21
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 4.9

Testing:
Speed rpm : 100
Minimum rack travel: 6.50
Speed rpm : 250
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION
Speed rpm : 330...420

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 170
Rack travel mm : 10.00...10.10

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.70...9.80
2nd pressure hPa : 650
Rack travel in m: 11.90...12.20
3rd pressure hPa : 1000
Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 170 (200)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 135.0...138.0
1000 s: (132.5...140.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 1000
Speed rpm : 800
Del.quantity cm³/ : 138.0...141.0
1000 s: (135.5...143.5)
Aneroid pressure h: 1000
Speed rpm : 1200
Del.quantity cm³/ : 134.5...137.5
1000 s: (132.0...140.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.50
Speed rpm : 1245...1260

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:
: MAN #3-7036
Start-of-delivery mark at 14° angular displacement of the cam after start of delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,2 V
Edition : 02.05.90
Replacement : -
Test oil : ISO-4113

Combination no. : 0 403 456 110

Injection pump
Pump designation : PES6MW100/321RS1201
EP type number : 0 413 406 190
Governor
Governor design. : RQ250/1200MW84-3
Governor no. : 0 420 082 043

Cust. part no. : 3-7047

Customer-spec. information
Customer : MAN

Engine : D 0826 LF02

1st version kW : 165.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
: (3.45...3.65)
Rack travel in mm : 15.00...0.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0
Rack travel in mm : 5.4...5.6
Del.quantity cm3/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm3 : 0.5
100 s: (0.7)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300
travel mm : 8.40...8.80
2nd speed rpm : 1260
travel mm : 6.60...6.80
3rd speed rpm : 345
travel mm : 4.00...4.60
4th speed rpm : 250
travel mm : 1.80...2.20

GUIDE SLEEVE POSITION

Control-lever position
Degree: -2
Speed rpm : 1000
Rack travel in mm : 18.20...19.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1000
Aneroid pressure h: 1000
Del.quantity : 137.0...139.0
1000 : (135.0...141.0)

Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 30...38

Setting point:
Speed rpm : 1000
Rack travel in mm : 19.0

Testing:
1st rack travel in: 11.50
Speed rpm : 1345...1360
2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:
Speed rpm : 100
Minimum rack travel: 7.00
Speed rpm : 250
Rack travel in mm : 5.40...5.60

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 12.50...12.60
2nd speed rpm : 600
Rack travel in m: 13.00...13.10
3rd speed rpm : 800
Rack travel in m: 12.50...12.80
4th speed rpm : 1200
Rack travel in m: 12.50...12.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 170
Rack travel mm : 10.00...10.10

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.70...9.80

2nd pressure hPa : 550
Rack travel in m: 11.70...12.00
3rd pressure hPa : 1000
Rack travel in m: 13.10...13.20

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm3/ : 135.0...138.0
1000 s: (132.5...140.5)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: 1000
Speed rpm : 800
Del.quantity cm3/ : 138.0...141.0
1000 s: (135.5...143.5)
Aneroid pressure h: 1000
Speed rpm : 1200
Del.quantity cm3/ : 134.5...137.5
1000 s: (132.0...140.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.50
Speed rpm : 1345...1360

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 5.00
1000 s: (7.00)

Remarks:
: MAN #3-7047
Start-of-delivery mark = 13,5° after
start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,2 Q 1
 Edition : 02.05.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 456 111
 Injection pump
 Pump designation : PES6MW100/321RS1186
 EP type number : 0 413 406 168
 Governor
 Governor design. : RQ250/1200MW84-4
 Governor no. : 0 420 082 044

Cust. part no. : 3-7083

Customer-spec. information
 Customer : MAN

Engine : D 0826 LUH

1st version kW : 157.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70
 : (3.55...3.75)
 Rack travel in mm : 15.00...0.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.70...14.80

Del.quantity cm³/ : 12.6...12.8

100 s: (12.4...13.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm³/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1280
 travel mm : 9.50...9.90

2nd speed rpm : 1250
 travel mm : 7.50...7.70

3rd speed rpm : 350
 travel mm : 5.20...5.80

4th speed rpm : 250
 travel mm : 2.20...2.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 126.0...128.0

1000 : (124.0...130.0)

Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 38...46

Setting point:
Speed rpm : 600
Rack travel in mm : 15.5

Testing:
1st rack travel in: 13.30
Speed rpm : 1245...1260
2nd rack travel in: 4.00
Speed rpm : 1290...1320
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:
Speed rpm : 100
Minimum rack travel: 7.50
Speed rpm : 250
Rack travel in mm : 5.40...5.60

TORQUE CONTROL
Dimension a mm : 0.30
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 14.70...14.80
2nd speed rpm : 600
Rack travel in m: 14.80...14.90
3rd speed rpm : 800
Rack travel in m: 14.80...14.90
4th speed rpm : 1200
Rack travel in m: 14.30...14.40

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 200
Rack travel mm : 12.70...12.80

Measurement
Speed 1/min : 500

1st pressure hPa : -

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Rack travel in m: 12.20...12.30
2nd pressure hPa : 400
Rack travel in m: 13.80...14.10
3rd pressure hPa : 1000
Rack travel in m: 14.80...14.90

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 126.5...129.5
1000 s: (124.0...132.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 1000
Speed rpm : 800
Del.quantity cm³/ : 126.5...129.5
1000 s: (124.0...132.0)
Aneroid pressure h: 1000
Speed rpm : 1200
Del.quantity cm³/ : 123.0...126.0
1000 s: (120.5...128.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.30
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...140.0
1000 s: (127.0...143.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 19.0...23.0
1000 s: (16.5...25.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks: : MAN #3-7083

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 C11
Edition : 12.04.90
Replaces : 05.01.90
Test oil : ISO-4113

Combination no. : 0 403 466 110

Injection pump
Pump designation : PES6MW100/120RS1137
EP type number : 0 413 406 131
Governor
Governor design. : RSV500...1250MW2A319
-6

Governor no. : 0 420 085 102

Cust. part no. : 3915688

Customer-spec. information
Customer : CUMMINS/US

Engine : 6 CTA-8.3 L

1st version kW : 171.0
Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
: (3.45...3.65)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250
Rack travel in mm : 12.80...12.90
Del.quantity cm3/ : 13.4...13.6
100 s: (13.2...13.8)
Spread cm3 : 0.3
100 s: (0.6)

2nd speed rpm : 500.0
Rack travel in mm : 6.5...6.7
Del.quantity cm3/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm3 : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...1.00

Governor spring pre-tension
Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1250
Del.quantity : 134.0...136.0
1000 : (132.0...138.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 41...49

Setting point:

Speed rpm : 800
Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.80
Speed rpm : 1320...1330
2nd rack travel in: 4.00
Speed rpm : 1350...1380
3rd rack travel in: 4.00
Speed rpm : 1360...1390
4th rack travel in: 1550
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 19...27
Setting point w/out bumper spring
Speed rpm : 500
Rack travel in mm : 6.1

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 500
Rack travel in mm : 6.00...6.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm3/ : 126.5...129.5
1000 s: (124.0...132.0)
Spread cm3 : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.80
Speed rpm : 1320...1330

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 125.0...145.0
1000 s: (122.0...148.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 500
Rack travel in mm : 6.50...6.70

Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: C.D.C #3915688
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 Q
Edition : 12.04.90
Replaces : 05.01.90
Test oil : ISO-4113

Combination no. : 0 403 466 123

Injection pump
Pump designation : PES6MW100/120RS1137-
2

EP type number : 0 413 406 180
Governor
Governor design. : RSV500...1250MW2A319
-16

Governer no. : 0 420 085 130

Cust. part no. : 3918357

Customer-spec. information
Customer : CUMMINS

Engine : 6 CTA-8.3 L

1st version kW : 171.0
Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
: (3.45...3.65)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 12.80...12.90

Del.quantity cm³/ : 13.4...13.6

100 s: (13.2...13.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 500.0

Rack travel in mm : 6.5...6.7

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 134.0...136.0

1000 : (132.0...138.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 41...49

Setting point:
Speed rpm : 800
Rack travel in mm : 0.6

Testing:
1st rack travel in: 11.80
Speed rpm : 1320...1330
2nd rack travel in: 4.00
Speed rpm : 1350...1380
3rd rack travel in: 4.00
Speed rpm : 1360...1390
4th rack travel in: 1550
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 19...27
Setting point w/out bumper spring
Speed rpm : 500
Rack travel in mm : 6.1

Testing:
Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 500
Rack travel in mm : 6.00...6.20

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 750
Del.quantity cm3/ : 126.5...129.5
1000 s: (124.0...132.0)
Spread cm3 : 5.00
1000 s: (7.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.80
Speed rpm : 1320...1330

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 125.0...145.0
1000 s: (122.0...148.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 500

E08

Rack travel in mm : 6.50...6.70
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: C.D.C #3918357
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 I
Edition : 05.03.90
Replaces : 24.11.89
Test oil : ISO-4113

Combination no. : 0 403 466 124

Injection pump
Pump designation : PES6MW100/120RS1178
EP type number : 0 413 406 160
Governor
Governor design. : RSV425...1250MW2A332
-2

Governer no. : 0 420 085 131

Cust. part no. : 3913758

Customer-spec. information
Customer : CUMMINS

Engine : 6 CT

1st version kW : 174.0
Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.45...3.55
: (3.40...3.60)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.80...13.90

Del.quantity cm³/ : 14.2...14.4

100 s: (14.0...14.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 425.0
Rack travel in mm : 5.4...5.6
Del.quantity cm³/ : 1.1...1.5
100 s: (0.8...1.7)

Spread cm³ : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 142.0...144.0
1000 : (140.0...146.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 42...50

Setting point:
Speed rpm : 800
Rack travel in mm : 0.6

Testing:
1st rack travel in: 12.80
Speed rpm : 940...950
2nd rack travel in: 4.00
Speed rpm : 1090...1120
3rd rack travel in: 4.00
Speed rpm : 1100...1130
4th rack travel in: 1250
Speed rpm : 0.30...1.40

LOW IDLE 1
Control lever
position degrees: 25...33
Setting point w/out bumper spring
Speed rpm : 425
Rack travel in mm : 5.0

Testing:
Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 425
Rack travel in mm : 4.90...5.10
Rack travel in mm : 2.00
Speed rpm : 525...585

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.80...11.00

Measurement
Speed 1/min : 500

1st pressure hPa : 305
Rack travel in m: 11.60...11.70
2nd pressure hPa : 465
Rack travel in m: 12.80...13.10
3rd pressure hPa : 900
Rack travel in m: 13.80...13.90

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm³/ : 92.5...94.5
1000 s: (90.5...96.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.80
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...180.0
1000 s: (155.0...185.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 425
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 11.0...15.0
1000 s: (8.5...17.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:
: C.D.C #3913758
Start-of-delivery mark at 14° angular
displacement of the cam after start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 66
Edition : 06.04.90
Replaces : 31.03.89
Test oil : ISO-4113

Combination no. : 0 403 476 070

Injection pump
Pump designation : PES6MW100/72ORS1172
EP type number : 0 413 406 155
Governor
Governor design. : RSV350...1300MWOA329
-4
Governor no. : 0 420 085 116

Customer-spec. information
Customer : DB-NKW

Engine : OM 366 LA

1st version kW : 170.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)

Rack travel in mm : 19.00...21.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 14.70...14.80

Del.quantity cm³/ : 10.8...11.0

100 s: (10.6...11.2)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0
Rack travel in mm : 5.9...6.1
Del.quantity cm³/ : 1.0...1.4
100 s: (0.7...1.6)
Spread cm³ : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 1000

Del.quantity : 108.0...110.0
1000 : (106.0...112.0)

Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.70

Speed rpm : 1330...1340

2nd rack travel in: 4.00

Speed rpm : 1410...1440
4th rack travel in: 1500
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.0

Testing:

Speed rpm : 100
Minimum rack travel: 7.60
Speed rpm : 350
Rack travel in mm : 5.90...6.10

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.70...11.80

Measurement

Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 12.60...12.80
2nd pressure hPa : 500
Rack travel in m: 13.70...13.90
3rd pressure hPa : 1000
Rack travel in m: 14.70...14.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 900
Del.quantity cm3/ : 101.0...104.0
1000 s: (98.5...106.5)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 42.0...44.0
1000 s: (40.0...46.0)
Spread cm3 : 3.50
1000 s: (6.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.70
Speed rpm : 1330...1340

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.90...6.10
Del.quantity cm3/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm3 : 3.50
1000 s: (5.00)

Remarks:

:

Test hydr. locking device for starting
with 500...1000 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 75
Edition : 19.03.90
Replaces : 15.08.89
Test oil : ISO-4113

Combination no. : 0 403 476 075

Injection pump
Pump designation : PES6MW100/72ORS1130
EP type number : 0 413 406 122
Governor
Governor design. : RSV350...750MWOA336-
1
Governor no. : 0 420 085 124

Customer-spec. information
Customer : MB-NFZ

Engine : OM366A

1st version kW : 84.0
Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)

Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.00...12.10

Del.quantity cm³/ : 8.0...8.2

100 s: (7.8...8.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0
Rack travel in mm : 6.5...6.8
Del.quantity cm³/ : 0.9...1.3
100 s: (0.7...1.5)
Spread cm³ : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Del.quantity : 80.0...82.0
1000 : (78.0...84.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 74...82

Setting point:
Speed rpm : 800
Rack travel in mm : 0.6

Testing:
1st rack travel in: 11.00
Speed rpm : 750...755
2nd rack travel in: 4.00
Speed rpm : 775...788

4th rack travel in: 800
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 61...69
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.6

Testing:
Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 6.50...6.80

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 88.0...98.0
1000 s; (85.0...101.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.50...6.80
Del.quantity cm³/ : 9.0...13.0
1000 s: (7.0...15.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 74
Edition : 01.02.90
Replaces : 15.08.89
Test oil : ISO-4113

Combination no. : 0 403 476 078

Injection pump
Pump designation : PES6MW100/72ORS1129
EP type number : 0 413 406 121
Governor
Governor design. : RSV350...750MWOA336
Governor no. : 0 420 085 127

Customer-spec. information
Customer : DB-NKW

Engine : OM 366 LA

1st version kW : 94.0
Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 8.5...8.7

100 s: (8.3...8.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.8

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 85.0...87.0

1000 : (83.0...89.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 74...82

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.5

Speed rpm : 750...755

2nd rack travel in: 4.00
Speed rpm : 775...788
4th rack travel in: 850
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 60...68
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.3

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 5.80...6.80

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.80...6.80
Del.quantity cm3/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 H 1
Edition : 30.03.90
Replaces : 02.02.90
Test oil : ISO-4113

Combination no. : 0 403 476 080

Injection pump
Pump designation : PES6MW100/72ORS1191
EP type number : 0 413 406 179
Governor
Governor design. : RSV350...1300MWOA329
-6

Governer no. : 0 420 085 136

Customer-spec. information
Customer : MB-NFZ

Engine : OM 366 LA

1st version kw : 170.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
: (3.45...3.65)

Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 11.2...11.4

100 s: (11.0...11.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 1000

Del.quantity : 112.0...114.0

1000 : (110.0...116.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 105...113

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.00
Speed rpm : 1330...1340
2nd rack travel in: 4.00
Speed rpm : 1420...1450
4th rack travel in: 1550
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 75...83
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.1

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 6.00...6.20

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.10...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 11.30...11.40
2nd pressure hPa : 500
Rack travel in m: 12.80...13.10
3rd pressure hPa : 1000
Rack travel in m: 14.00...14.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 101.0...104.0
1000 s: (98.5...106.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 35.0...37.0
1000 s: (33.0...39.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack travel: 13.00
Speed rpm : 1330...1340

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.00...6.20
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

Test hydr. locking device for starting
with 500...1000 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 8,4 C
 Edition : 05.03.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 476 081
 Injection pump
 Pump designation : PES6MW100/72ORS1196
 EP type number : 0 413 406 184
 Governor
 Governor design. : RSV350...1050MW1A338
 Governor no. : 0 420 085 138

Customer-spec. information
 Customer : LIEBHERR

Engine : D 916 T

1st version kW : 170.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.40...3.50
 : (3.35...3.55)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 13.9...14.1

100 s: (13.7...14.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1000

Del.quantity : 139.0...141.0

1000 : (137.0...143.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 105...113

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.20

Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1130...1160
4th rack travel in: 1400
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 75...83
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.0

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 5.90...6.10

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.00...10.10

Measurement

Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 11.30...11.40
2nd pressure hPa : 500
Rack travel in m: 12.80...13.10
3rd pressure hPa : 1000
Rack travel in m: 11.20...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 500
Del.quantity cm³/ : 133.0...136.0
1000 s: (130.5...138.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 1000
Speed rpm : 800
Del.quantity cm³/ : 140.0...143.0
1000 s: (137.5...145.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 119.0...121.0
1000 s: (117.0...123.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.20
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...130.0
1000 s: (117.0...133.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.90...6.10
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 13,4D17
Edition : 30.03.90
Replaces : 12.02.90
Test oil : ISO-4113

Combination no. : 0 403 548 036

Injection pump
Pump designation : PE8MW100/720LS1128
EP type number : 0 413 508 103
Governor
Governor design. : RQV425...900MW76-1
Governor no. : 0 420 083 210

Customer-spec. information
Customer : KHD

Engine : BF 8L 513

1st version kW : 160.0

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20
: (3.05...3.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-

4- 3

Phasing : 0-45-90-135-180-225-
270-315
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.50...10.60

Del.quantity cm3/ : 10.3...10.5

100 s: (10.1...10.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 5.8...6.0

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1000
travel mm : 9.50...10.10

2nd speed rpm : 950
travel mm : 8.70...8.90

3rd speed rpm : 600
travel mm : 3.90...4.50

4th speed rpm : 425
travel mm : 1.60...2.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 925

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Del.quantity : 103.0...105.0

1000 : (101.0...107.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 49...57

Testing:
1st rack travel in: 9.50
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 955...985
4th rack travel in: 1050
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 18...26
Setting point w/out bumper spring
Speed rpm : 425
Rack travel in mm : 5.9

Testing:
Speed rpm : 100
Minimum rack travel: 6.50
Speed rpm : 425
Rack travel in mm : 5.80...6.00

CONSTANT REGULATION

Speed rpm : 430...490

TORQUE CONTROL

Dimension a mm : 0.70
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 10.50...10.60
2nd speed rpm : 600
Rack travel in m: 11.20...11.30
3rd speed rpm : 750
Rack travel in m: 10.80...11.00

START CUT-OUT

Speed 1/min : 350 (370)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm³/ : 108.5...111.5
1000 s: (106.0...114.0)
Spread cm³ : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.50
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...150.0
1000 s: (137.0...153.0)

LOW IDLE

Speed rpm : 425
Rack travel in mm : 5.80...6.00
Del.quantity cm³/ : 13.0...17.0
1000 s: (10.5...19.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 13,4 d
Edition : 02.05.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 403 548 037
Injection pump
Pump designation : PE8MW100/720LS1128
EP type number : 0 413 508 103
Governor
Governor design. : RQV450...1150MW70-2
Governor no. : 0 420 083 211

Customer-spec. information
Customer : KHD

Engine : BF 8L 513

1st version kW : 160.0
Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20
: (3.05...3.25)
Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-
4- 3

Phasing : 0-45-90-135-180-225-
270-315
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150
Rack travel in mm : 11.00...11.10
Del.quantity cm³/ : 11.4...11.6
100 s: (11.2...11.8)
Spread cm³ : 0.3
100 s: (0.6)

2nd speed rpm : 450.0
Rack travel in mm : 5.6...5.8
Del.quantity cm³/ : 1.3...1.7
100 s: (1.0...1.9)
Spread cm³ : 0.3
100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200
travel mm : 9.00...9.40
2nd speed rpm : 1000
travel mm : 6.20...6.40
3rd speed rpm : 600
travel mm : 2.50...3.10
4th speed rpm : 450
travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1150
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1150
Del.quantity : 114.0...116.0
1000 : (112.0...118.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 10.00
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1230...1260
4th rack travel in: 1320
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 15...23
Setting point w/out bumper spring
Speed rpm : 450
Rack travel in mm : 5.7

Testing:
Speed rpm : 100
Minimum rack trave: 7.50
Speed rpm : 450
Rack travel in mm : 5.60...5.80

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 11.00...11.10

START CUT-OUT

Speed 1/min : 350 (370)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.00
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...150.0
1000 s: (137.0...153.0)

LOW IDLE

Speed rpm : 450
Rack travel in mm : 5.60...5.80
Del.quantity cm3/ : 13.0...17.0
1000 s: (10.5...19.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 b7
Edition : 01.02.90
Replaces : 1.9.88
Test oil : ISO-4113

Combination no. : 9 400 230 103

Injection pump
Pump designation : PES6A100D410RS2691-2
EP type number : 9 410 230 028
Governor
Governor design. : RQV350...1100AB1227R
Governor no. : 9 420 231 015

Customer-spec. information
Customer : C.D.C.

Engine : 6 CT 8.3

1st version kW : 156.6
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.60...12.70

Del. quantity cm3/ : 12.6...12.8

100 s: (12.4...13.0)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del. quantity cm3/ : 1.8...2.2
100 s: (1.5...2.4)

Spread cm3 : 0.6

100 s: (0.8)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1100
travel mm : 7.70...7.70

2nd speed rpm : 1150
travel mm : 8.00...8.60

3rd speed rpm : 1290
travel mm : 9.50...10.10

4th speed rpm : 350
travel mm : 1.20...1.60

5th speed rpm : 600
travel mm : 3.90...4.50

GUIDE SLEEVE POSITION

Control-lever position
Degree: ?

Speed rpm : ?

Rack travel in mm : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 126.5...128.5
1000 : (124.5...130.5)
Spread cm3 : 4.00
1000 : (6.50)

RATED SPEED

1st version
Control lever
position degrees: 60...68

Testing:

1st rack travel in: 11.60
Speed rpm : 1145...1155
2nd rack travel in: 4.00
Speed rpm : 1260...1290
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 9...17
Speed rpm : 350
Rack travel in mm : 5.40...5.60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.60...12.70

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.10...10.30
2nd pressure hPa : 405
Rack travel in m: 10.90...11.00
3rd pressure hPa : 535
Rack travel in m: 11.80...12.20

START CUT-OUT

Speed 1/min : 260 (280)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 79.0...83.0
1000 s: (77.0...85.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.60
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 165.0...185.0
1000 s: (160.0...190.0)
Rack travel in mm : 15.30...15.70

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 18.0...22.0
1000 s: (15.5...24.5)
Spread cm3 : 6.00
1000 s: (8.00)

Remarks: : C.D.C. # 3912645

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark is at 7° after
start of delivery.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 k 1
Edition : 01.02.90
Replaces : 7.4.89
Test oil : ISO-4113

Combination no. : 9 400 230 106

Injection pump
Pump designation : PES6A100D320/3RS2691
EP type number : 9 410 230 025
Governor
Governor design. : RSV400...1050AOC2216
-1R
Governor no. : 9 420 234 154

Customer-spec. information
Customer : C.D.C.

Engine : 6 CT 8.3

1st version kW : 141.7
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.90...12.00

Del.quantity cm3/ : 11.5...11.7

100 s: (11.3...11.9)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0
Rack travel in mm : 5.8...6.0
Del.quantity cm3/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm3 : 0.6
100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 115.0...117.0

1000 : (113.0...119.0)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 10.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1145...1175
4th rack travel in: 1200
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 23...31
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 5.80...6.00

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 11.90...12.00
2nd speed rpm : 750
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 134.0...138.0
1000 s: (132.0...140.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...155.0
1000 s: (132.0...158.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.80...6.00
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: C.D.C. # 3915951

Adjust stop lever to 0.5...1.0 mm
before stop.

Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 b 3
Edition : 01.02.90
Replaces : 28.9.89
Test oil : ISO-4113
Combination no. : 9 400 230 107
Injection pump
Pump designation : PES6A100D320/3RS2691
-2
EP type number : 9 410 230 028
Governor
Governor design. : RQV350...1200AB1233R
Governor no. : 9 420 231 018

Customer-spec. information
Customer : C.D.C

Engine : 6CT830

1st version kW : 157.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 9 681 271 029

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 11.3...11.5

100 s: (11.1...11.7)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.6

100 s: (0.8)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 0.00...0.20

2nd speed rpm : 350
travel mm : 1.00...1.50

3rd speed rpm : 450
travel mm : 1.90...2.40

4th speed rpm : 1200
travel mm : 6.90...6.90

5th speed rpm : 1350
travel mm : 8.15...8.65

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1435

Rack travel in mm : 6.70...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700
Del.quantity : 113.0...115.0
1000 : (111.0...117.0)
Spread cm3 : 4.00
1000 : (6.50)

RATED SPEED

1st version
Control lever
position degrees: 40...46

Testing:
1st rack travel in: 9.80
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1315...1345
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...15
Speed rpm : 350
Rack travel in mm : 4.60...4.80

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 240
Rack travel mm : 9.70...9.80

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.30...9.50
2nd pressure hPa : 333
Rack travel in m: 10.20...10.60

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 84.5...88.5
1000 s: (82.5...90.5)

BREAKAWAY

F02

1st version
1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...170.0
1000 s: (145.0...175.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 6.00
1000 s: (8.00)

Remarks:
: C.D.C. # 3908558

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm
before stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 b10
 Edition : 06.03.90
 Replaces : -
 Test oil : ISO-4113

Combination no. : 9 400 230 107JA

Injection pump
 Pump designation : PES6A100D320/3RS2691
 -2
 EP type number : 9 410 230 028
 Governor
 Governor design. : RQV350...1050AB1233-
 R
 Governor no. : 9 420 231

Cust. part no. : 3279419

Customer-spec. information
 Customer : C.D.C

Engine : 6CT830

1st version kW : 153.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 9 681 271 029

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 11.6...11.8

100 s: (11.4...12.0)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 3.3...3.9

100 s: (3.1...4.1)

Spread cm3 : 0.6

100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 0.00...0.20

2nd speed rpm : 350
 travel mm : 1.00...1.50

3rd speed rpm : 450
 travel mm : 1.90...2.40

4th speed rpm : 1200
 travel mm : 6.90...6.90

5th speed rpm : 1350
 travel mm : 8.15...8.65

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1435

Rack travel in mm : 6.70...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Aneroid pressure h: 900
Del.quantity : 116.0...118.0
1000 : (114.0...120.0)
Spread cm³ : 4.00
1000 : (6.50)

RATED SPEED

1st version
Control lever
position degrees: 35...43

Testing:
1st rack travel in: 10.10
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1195...1125
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 11...19
Speed rpm : 350
Rack travel in mm : 6.30...6.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.10...11.20

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.30...9.50
2nd pressure hPa : 300
Rack travel in m: 9.80...9.90
3rd pressure hPa : 440
Rack travel in m: 10.50...10.90

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 77.5...81.5
1000 s: (75.5...83.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.10
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...170.0
1000 s: (145.0...175.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.30...6.50
Del.quantity cm³/ : 33.0...39.0
1000 s: (31.0...41.0)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

:
Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm
before stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,6 h14
Edition : 01.02.90
Replaces : 26.6.89
Test oil : ISO-4113

Combination no. : 9 400 230 108

Injection pump
Pump designation : PES6A100D410RS2676-1
EP type number : 9 410 230 024
Governor
Governor design. : RSV450...1050A2C2204
-1L
Governor no. : 9 420 234 163

Customer-spec. information
Customer : JOHN DEERE

Engine : 6466 AT

1st version kW : 120.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
x Wall thickness : 6.00X2.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.45...2.55
: (2.40...2.60)

Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.00...10.10

Del.quantity cm3/ : 10.4...10.6

100 s: (10.2...10.8)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 104.0...106.0

1000 : (102.0...108.0)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 43...51

Testing:

1st rack travel in: 9.00

Speed rpm : 1095...1105

2nd rack travel in: 4.00

Speed rpm : 1155...1165
3rd rack travel in: 4.00
Speed rpm : 1160...1180
4th rack travel in: 1250
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 23...31
Setting point w/out bumper spring
Speed rpm : 450
Rack travel in mm : 4.9

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 450
Rack travel in mm : 5.30...5.50

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 10.00...10.10
2nd speed rpm : 650
Rack travel in m: 10.60...10.80
3rd speed rpm : 900
Rack travel in m: 10.00...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650
Del.quantity cm3/ : 109.0...113.0
1000 s: (107.0...115.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.00
Speed rpm : 1095...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...190.0
1000 s: (165.0...195.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 450
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)

Spread cm3 : 6.00
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE29233
Start-of-delivery mark at control-rod
travel 10.5 mm and 15° after start of
delivery.

APPLICATION

Excavator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a60
Edition : 28.09.89
Replaces : 2.5.89
Test oil : ISO-4113

Combination no. : 9 400 230 109

Injection pump
Pump designation : PES6A100D320/3RS2691
EP type number : 9 410 230 030
Governor
Governor design. : RSV450...1100AOC2190
-41R
Governor no. : 0 420 233 247

Customer-spec. information
Customer : C.D.C.

Engine : 6CT830

1st version kW : 117.1
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

F07

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 8.9...9.1

100 s: (8.7...9.3)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 450.0
Rack travel in mm : 5.7...5.9
Del.quantity cm3/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm3 : 0.6
100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1100
Del.quantity : 89.0...91.0
1000 : (87.0...93.0)
Spread cm3 : 4.00
1000 : (6.50)

RATED SPEED

1st version
Control lever
position degrees: 47...55

Testing:

1st rack travel in: 9.20
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1190...1220
3rd rack travel in: 4.00
Speed rpm : 1195...1225
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 29...37
Setting point w/out bumper spring
Speed rpm : 450
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 450
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 525...585

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 10.20...10.30
2nd speed rpm : 750
Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm3/ : 90.5...94.5
1000 s: (88.5...96.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 450
Rack travel in mm : 5.70...5.90

F08

Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 6.00
1000 s: (8.00)

Remarks:

: C.D.C. # 3915683

Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a61
 Edition : 01.02.90
 Replaces : 7.4.89
 Test oil : ISO-4113

Combination no. : 9 400 230 110

Injection pump
 Pump designation : PES6A100D320/3RS2691
 -4
 EP type number : 9 410 230 030
 Governor
 Governor design. : RSV450...1100A0C2190
 -42R
 Governor no. : 0 420 233 248

Customer-spec. information
 Customer : C.D.C.

Engine : 6CT830

1st version kW : 150.6
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Phasing :
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 11.8...12.0

100 s: (11.6...12.2)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 450.0
 Rack travel in mm : 5.7...5.9
 Del.quantity cm3/ : 1.6...2.0
 100 s: (1.3...2.2)
 Spread cm3 : 0.6
 100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Del.quantity : 118.5...120.5
 1000 : (116.5...122.5)
 Spread cm3 : 4.00
 1000 : (6.50)

RATED SPEED

1st version
 Control lever
 position degrees: 42...50

Testing:
1st rack travel in: 11.10
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1195...1225
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1
Control lever
position degrees: 22...30
Setting point w/out bumper spring
Speed rpm : 450
Rack travel in mm : 5.3

Testing:
Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 450
Rack travel in mm : 5.70...5.90

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.10...12.20
2nd speed rpm : 750
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 750
Del.quantity cm3/ : 133.0...137.0
1000 s: (131.0...139.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.10
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 450
Rack travel in mm : 5.70...5.90
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)

Spread cm3 : 6.00
1000 s: (8.00)

Remarks:
: C.D.C. # 3915685
Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm
before stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a62
Edition : 01.02.90
Replaces : 7.4.89
Test oil : ISO-4113

Combination no. : 9 400 230 111

Injection pump
Pump designation : PES6A100D320/3RS2691
-4

EP type number : 9 410 230 030

Governor
Governor design. : RSV450...1100AOC2190
-40R

Governor no. : 0 420 233 246

Customer-spec. information
Customer : C.D.C.

Engine : 6CT830

1st version kW : 134.2
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100
Rack travel in mm : 11.20...11.30
Del.quantity cm3/ : 10.1...10.3
100 s: (9.9...10.5)
Spread cm3 : 0.4
100 s: (0.6)

2nd speed rpm : 450.0
Rack travel in mm : 5.7...5.9
Del.quantity cm3/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm3 : 0.6
100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...0.70

Governor spring pre-tension
Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1100
Del.quantity : 101.0...103.0
1000 : (99.0...105.0)
Spread cm3 : 4.00
1000 : (6.50)

RATED SPEED

1st version
Control lever
position degrees: 49...57

Testing:

1st rack travel in: 10.20
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1210...1240
3rd rack travel in: 4.00
Speed rpm : 1215...1245
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 31...39
Setting point w/out bumper spring
Speed rpm : 450
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 450
Rack travel in mm : 5.70...5.90

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 11.20...11.30
2nd speed rpm : 750
Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 110.5...114.5
1000 s: (108.5...116.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 450
Rack travel in mm : 5.70...5.90

Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: C.D.C. # 3915684
Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm
before stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,6 z
Edition : 01.02.90
Replaces : 14.1.88
Test oil : ISO-4113

Combination no. : 9 400 230 114

Injection pump
Pump designation : PES6A100D410RS2741
EP type number : 9 410 230 031
Governor
Governor design. : RSV400...1100A2C2204
-2L
Governor no. : 9 420 234 177

Customer-spec. information
Customer : JOHN DEERE

Engine : 6466 TT

1st version kw : 124.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 130...150

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.95...3.05
(2.90...3.10)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.30...10.40

Del.quantity cm³/ : 10.5...10.7
100 s: (10.3...10.9)

Spread cm³ : 0.3
100 s: (0.6)

2nd speed rpm : 400.0
Rack travel in mm : 4.2...4.4
Del.quantity cm³/ : 1.2...1.6
100 s: (0.9...1.8)
Spread cm³ : 0.7
100 s: (0.9)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1100
Del.quantity : 105.0...107.0
1000 : (103.0...109.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 44...52

Testing:

1st rack travel in: 9.30
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1195...1205
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 19...27
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 3.8

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 4.20...4.40
Rack travel in mm : 2.00
Speed rpm : 520...580

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 10.30...10.40
2nd speed rpm : 700
Rack travel in m: 11.50...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm³/ : 127.5...130.5
1000 s: (125.0...133.0)
Speed rpm : 750
Spread cm³ : 4.00
1000 s: (5.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...150.0
1000 s: (125.0...155.0)
Rack travel in mm : 19.00...21.00

F14

LOW IDLE

Speed rpm : 400
Rack travel in mm : 4.20...4.40
Del.quantity cm³/ : 12.0...16.0
1000 s: (9.5...18.5)
Spread cm³ : 7.00
1000 s: (9.00)

Remarks:

: JOHN DEERE # RE29255
Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Starting/full-load transition speed
from holding magnet = 450 1/min.

Start-of-delivery mark = 12,5° after
start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a10
 Edition : 01.02.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 230 115
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1250A0C2190
 -24R
 Governor no. : 9 420 234 178

Customer-spec. information
 Customer : C.D.C.

Engine : 6 CTA 8.3

1st version kW : 131.0

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.90...11.00

Del.quantity cm3/ : 9.9...10.1

100 s: (9.7...10.3)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 1.2...1.6

100 s: (0.9...1.8)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 99.0...101.0

1000 : (97.0...103.0)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 51...59

Testing:

1st rack travel in: 9.90

Speed rpm : 1290...1300
2nd rack travel in: 4.00
Speed rpm : 1360...1390
4th rack travel in: 1450
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 26...34
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 4.9

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.30...5.50

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 12.0...16.0
1000 s: (9.5...18.5)
Spread cm3 : 6.00
1000 s: (8.00)

Remarks:

: C.D.C. # 3915981

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a 9
Edition : 06.03.90
Replaces : 2.5.89
Test oil : ISO-4113

Combination no. : 9 400 230 116

Injection pump
Pump designation : PES6A100D320/3RS2691
EP type number : 9 410 230 025
Governor
Governor design. : RSV400...1050ADC2190
-25R
Governor no. : 9 420 234 182

Customer-spec. information
Customer : C.D.C

Engine : 6 CT 8.3

1st version kW : 154.4
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.40...12.50

Del. quantity cm3/ : 12.2...12.4

100 s: (12.0...12.6)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0
Rack travel in mm : 5.8...6.0
Del. quantity cm3/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm3 : 0.6
100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Del. quantity : 122.5...124.5
1000 : (120.5...126.5)
Spread cm3 : 4.00
1000 : (6.50)

RATED SPEED

1st version
Control lever
position degrees: 38...46

Testing:

1st rack travel in: 11.40
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1130...1160
3rd rack travel in: 4.00
Speed rpm : 1135...1165
4th rack travel in: 1275
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 19...27
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.4

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.30...5.50

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.40
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.80...6.00
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 6.00
1000 s: (8.00)

Remarks:
: C.D.C. # 3915962

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark at 10° cam
rotation angle after start of delivery,
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 b 4
Edition : 28.09.89
Replaces : 7.4.89
Test oil : ISO-4113

Combination no. : 9 400 230 119

Injection pump
Pump designation : PES6A100D320/3RS2691
-2

EP type number : 9 410 230 028
Governor
Governor design. : RQV350...1250AB1235R
Governor no. : 9 420 231 020

Customer-spec. information
Customer : C.D.C.

Engine : 6 CT-830

1st version kW : 157.0
Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.90...12.00

Del.quantity cm3/ : 12.5...12.7

100 s: (12.3...12.9)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 350.0
Rack travel in mm : 5.0...5.2
Del.quantity cm3/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm3 : 0.6
100 s: (0.8)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1400
travel mm : 8.40...8.50
2nd speed rpm : 1500
travel mm : 9.10...9.30
3rd speed rpm : 350
travel mm : 0.70...1.10
4th speed rpm : 450
travel mm : 1.60...2.00
5th speed rpm : 250
travel mm : 0.10...0.50

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1550
Rack travel in mm : 6.70...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1250

Aneroid pressure h: 700
Del.quantity : 125.0...127.0
1000 : (123.0...129.0)
Spread cm³ : 4.00
1000 : (6.50)

RATED SPEED

1st version
Control lever
position degrees: 41...49

Testing:
1st rack travel in: 10.90
Speed rpm : 1290...1300
2nd rack travel in: 4.00
Speed rpm : 1415...1445
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...15

Testing:
Speed rpm : 250
Minimum rack travel: 7.80
Speed rpm : 350
Rack travel in mm : 5.00...5.20

CONSTANT REGULATION
Speed rpm : 350...500

TORQUE CONTROL
Dimension a mm : 0.50
Torque control curve - 1st version
1st speed rpm : 1250
Rack travel in m: 11.90...12.00
2nd speed rpm : 750
Rack travel in m: 12.30...12.50
3rd speed rpm : 1200
Rack travel in m: 11.90...12.00
4th speed rpm : 800
Rack travel in m: 12.30...12.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 12.30...12.50

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.70...8.90

2nd pressure hPa : 200
Rack travel in m: 9.80...9.90
3rd pressure hPa : 390
Rack travel in m: 11.20...11.60

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 700
Speed rpm : 750
Del.quantity cm³/ : 128.0...132.0
1000 s: (126.0...134.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 61.5...65.5
1000 s: (59.5...67.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.90
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...190.0
1000 s: (165.0...195.0)
Rack travel in mm : 14.60...14.80

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.00...5.20
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks: : C.D.C. # 3912636

Start-of delivery mark/lock = 7.5°
angular displacement of the cam after
start of delivery of cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 5,9 b
Edition : 28.09.89
Replaces : 20.12.88
Test oil : ISO-4113

Combination no. : 9 400 230 120

Injection pump
Pump designation : PES6A95D320RS2750
EP type number : 0 410 896 906
Governor
Governor design. : RQV350...1350AB1236R
Governor no. : 9 420 231 021

Customer-spec. information
Customer : NAVISTAR

Engine : MARS DTA360

1st version kW : 134.0
Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
assembly : 1 688 901 110

Opening
pressure, bar : 250...253

Orifice plate
diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 7.3...7.5

100 s: (7.1...7.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 1.5...1.9

100 s: (1.2...2.1)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 7.30...7.50

2nd speed rpm : 1460

travel mm : 8.10...8.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1535

Rack travel in mm : 6.70...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Aneroid pressure h: 900

Del.quantity : 73.0...75.0

1000 : (71.0...77.0)

Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 45...53

Testing:
1st rack travel in: 10.10
Speed rpm : 1415...1445
2nd rack travel in: 4.00
Speed rpm : 1530...1540
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16

Testing:
Speed rpm : 250
Minimum rack travel: 7.80
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION
Speed rpm : 350...500

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.10...11.20

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.80...9.00
2nd pressure hPa : 250
Rack travel in m: 10.00...10.10
3rd pressure hPa : 190
Rack travel in m: 9.30...9.70

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm3/ : 57.0...61.0
1000 s: (55.0...63.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.10
Speed rpm : 1415...1445

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 125.0...145.0
1000 s: (120.0...150.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 15.0...19.0
1000 s: (12.5...21.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 5,9 b 1
 Edition : 28.09.89
 Replaces : 7.4.89
 Test oil : ISO-4113
 Combination no. : 9 400 230 121
 Injection pump
 Pump designation : PES6A95D320RS275D
 EP type number : 0 410 896 906
 Governor
 Governor design. : RQV350...1350AB1236-1R
 Governor no. : 9 420 231 022

Customer-spec. information
 Customer : NAVISTAR

Engine : MARS DT 360

1st version kW : 126.0
 Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 110

Opening
 pressure, bar : 250...253

Orifice plate
 diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 7.3...7.5

100 s: (7.1...7.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 1.5...1.9

100 s: (1.2...2.1)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 7.30...7.50

2nd speed rpm : 1460

travel mm : 8.10...8.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1535

Rack travel in mm : 6.70...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Aneroid pressure h: 900

Del.quantity : 73.0...75.0
1000 : (71.0...77.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 45...53

Testing:
1st rack travel in: 10.10
Speed rpm : 1415...1445
2nd rack travel in: 4.00
Speed rpm : 1530...1540
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16

Testing:
Speed rpm : 250
Minimum rack travel: 7.80
Speed rpm : 350
Rack travel in mm : 5.20...5.40

CONSTANT REGULATION
Speed rpm : 350...500

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.10...11.20

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.70...8.90
2nd pressure hPa : 320
Rack travel in m: 9.90...10.00
3rd pressure hPa : 230
Rack travel in m: 9.20...9.60

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version

F24

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 55.5...59.5
1000 s: (53.5...61.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.10
Speed rpm : 1415...1445

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 125.0...145.0
1000 s: (120.0...150.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 15.0...19.0
1000 s: (12.5...21.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:
: NAVISTAR #1811834C92
Limit shutoff stop screw to 1.0 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 5,9 c
Edition : 01.02.90
Replaces : 15.6.88
Test oil : ISO-4113

Combination no. : 9 400 230 122

Injection pump
Pump designation : PES6A95D32ORS2745
EP type number : 9 410 230 033
Governor
Governor design. : RQV350...1350AB1236-2R
Governor no. : 9 420 231 023

Customer-spec. information
Customer : NAVISTAR

Engine : MARS DTA360

1st version kW : 130.0
Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
assembly : 1 688 901 110

Opening
pressure, bar : 250...253

Orifice plate
diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 7.8...8.0

100 s: (7.6...8.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.3

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 7.30...7.50

2nd speed rpm : 1460

travel mm : 8.10...8.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Aneroid pressure h: 900

Del.quantity : 78.0...80.0

1000 : (76.0...82.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 44...52

Testing:
1st rack travel in: 10.50
Speed rpm : 1425...1455
2nd rack travel in: 4.00
Speed rpm : 1540...1550
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16

Testing:
Speed rpm : 250
Minimum rack travel: 7.80
Speed rpm : 350
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION
Speed rpm : 350...500

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.50...11.60

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.40...8.60
2nd pressure hPa : 190
Rack travel in m: 9.10...9.20
3rd pressure hPa : 375
Rack travel in m: 10.60...11.00

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : -
1000 s: (50.0...58.0)

BREAKAWAY

F26

1st version
1mm rack travel less than

full load rack tr: 10.50
Speed rpm : 1425...1455

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...170.0
1000 s: (145.0...175.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.10...5.30
Del.quantity cm3/ : 13.0...17.0
1000 s: (10.5...19.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:
: NAVISTAR #1811836C92

Limit shutoff stop screw to 1.0 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 10,1 a9
 Edition : 01.02.90
 Replaces : 26.6.89
 Test oil : ISO-4113
 Combination no. : 9 400 231 039
 Injection pump
 Pump designation : PES6P110A720RS370
 EP type number : 0 412 016 052
 Governor
 Governor design. : RSV450...1050POA465
 Governor no. : 9 420 234 180

Customer-spec. information
 Customer : JOHN DEERE

Engine : 6619A

1st version kW : 201.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X3.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.75...2.85
 : (2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 450.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 1.9...2.5

100 s: (1.7...2.7)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 47...55

Testing:

1st rack travel in: 11.40

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1220...1250

4th rack travel in: 1300

Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 25...33

Setting point w/out bumper spring

Speed rpm : 450

Rack travel in mm : 5.6

Testing:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm : 450

Rack travel in mm : 6.00...6.20

Rack travel in mm : 2.00

Speed rpm : 600...660

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 12.40...12.50

2nd speed rpm : 650

Rack travel in m: 13.60...13.80

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 900

Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.50...10.70

2nd pressure hPa : 280

Rack travel in m: 11.70...11.80

3rd pressure hPa : 480

Rack travel in m: 12.80...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 650

Del.quantity cm3/ : 198.5...201.5

1000 s: (195.0...205.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : -

1000 s: (123.0...133.0)

BREAKAWAY

1st version

F28

1mm rack travel less than

full load rack tr: 11.40

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0

1000 s: (165.0...215.0)

Rack travel in mm : 20.00...21.00

HIGH IDLE

1st version

Speed rpm : 1170

Rack travel in mm : 7.40...7.60

LOW IDLE

Speed rpm : 450

Rack travel in mm : 6.00...6.20

Del.quantity cm3/ : 19.0...25.0

1000 s: (17.0...27.0)

Spread cm3 : 4.50

1000 s: (7.50)

Remarks:

: JOHN DEERE # RE29146

Start-of-delivery mark at control-rod travel 10.5 mm and 15° after start of delivery.

Starting/full-load transition speed from holding magnet = 400 1/min.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 10,9 c4
 Edition : 20.3.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 093
 Injection pump
 Pump designation : PES6P120A720/3RS6008
 Governor
 Governor design. : RQV300/500...975PA
 591K

Cust. part no. : *

Customer-spec. information
 Customer : MACK

Engine : EE6-350

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 40...42

Inlet press., bar : 1.5

Test nozzle holder
 assembly : *

Opening
 pressure, bar : 300...308

Test lines : 9 681 230 727

Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X990.60

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.20...3.30
 : (3.15...3.35)
 Rack travel in mm : 11.5
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

G01

BASIC SETTING

1st speed rpm : 975
 Rack travel in mm : 14.50...14.60
 Del.quantity cm3/ : 20.9...21.1
 100 s : (-)
 Spread cm3 : 0.4
 100 s : (0.75)
 2nd speed rpm : 300
 Rack travel in mm : 5.40...5.50
 Del.quantity cm3/ : 1.5...2.5
 100 s : (-)
 Spread cm3 : 0.6
 100 s : (-)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1045
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 975
 Del.quantity : 209.0...211.0
 1000 : (-)

RATED SPEED

1st version
 Control lever
 position degrees: 54.5...59.5

Testing:
 1st rack travel in: 13.50
 Speed rpm : 1015...1025
 2nd rack travel in: 4.00
 Speed rpm : 1140...1170
 4th rack travel in: 1190
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 17.5...22.5

Testing:
 Speed rpm : 250
 Minimum rack trave: 9.80
 Speed rpm : 400
 Rack travel in mm : 3.80...5.20
 Rack travel in mm : 2.00
 Speed rpm : 690...750

TORQUE CONTROL

Dimension a mm : 1.50
Torque control curve - 1st version
1st speed rpm : 975
Rack travel in m: 14.50...14.60
2nd speed rpm : 900
Rack travel in m: 14.45...14.55
3rd speed rpm : 800
Rack travel in m: 14.55...14.65
4th speed rpm : 650
Rack travel in m: 14.15...14.25
5th speed rpm : 500
Rack travel in m: 13.15...13.25

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm3/ : 234.5...239.5
1000 s: (-)
Speed rpm : 650
Del.quantity cm3/ : 231.0...237.0
1000 s: (-)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50
Speed rpm : 1015...1025

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 120.0...180.0
1000 s: (-)
Rack travel in mm : 12.00...12.10

LOW IDLE

Speed rpm : 300
Del.quantity cm3/ : 15.0...25.0
1000 s: (-)

Remarks:

: MACK # 313 GC 5144 P
: 1

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to test-
ing of the injection-pump assembly with
the genuine engine/nozzle-and-holder

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,0 x9
 Edition : 5.4.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 135
 Injection pump
 Pump designation : PES6P110A720RS6006
 Governor
 Governor design. : RQV300/600...1050PA
 621K

Cust. part no. : *

Customer-spec. information
 Customer : MACK

Engine : EM6-250

TEST BENCH REQUIREMENTS

Test oil
 Outlet temp, °C : 40...45

Overflow valve : 2 417 413 011

Inlet press., bar : 1.5

Test nozzle holder
 assembly : *

Opening
 pressure, bar : 300...308

Test lines : 9 681 230 727

Outside diameter
 x Wall thickness : 6.35X1.70X991
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.2...3.3
 : (3.15...3.35)
 Rack travel in mm : 10.50
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.5 (0.75)

BASIC SETTING

1st speed rpm : 1000
 Rack travel in mm : 11.50
 Del.quantity cm3/ : 14.5...14.7
 100 s : (-)
 Spread cm3 : 0.4
 100 s : (-)
 2nd speed rpm : 300
 Rack travel in mm : 4.70
 Del.quantity cm3/ : 1.8...2.8
 100 s : (-)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1125
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1000
 Del.quantity : 145.0...147.0
 1000 : (-)

RATED SPEED

1st version
 Control lever
 position degrees: 58...63

Testing:
 1st rack travel in: 10.50
 Speed rpm : 1090...1100
 2nd rack travel in: 4.00
 Speed rpm : 1170...1200
 4th rack travel in: 1230
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 17.5...22.5

Testing:
 Speed rpm : 250
 Minimum rack travel: 9.50
 Speed rpm : 400
 Rack travel in mm : 3.80...5.20
 Rack travel in mm : 2.00

Speed rpm : 700...760

TORQUE CONTROL

Dimension a mm : 1.15

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 11.50

2nd speed rpm : 1050

Rack travel in m: 11.45...11.55

3rd speed rpm : 850

Rack travel in m: 11.80...11.90

4th speed rpm : 630

Rack travel in m: 12.60...12.70

5th speed rpm : 500

Rack travel in m: 12.20...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 850

Del.quantity cm³/ : 157.0...159.0

1000 s: (-)

Speed rpm : 630

Del.quantity cm³/ : 190.0...194.0

1000 s: (-)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.50

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 120.0...180.0

1000 s: (-)

LOW IDLE

Speed rpm : 300

Del.quantity cm³/ : 18.0...28.0

1000 s: (-)

Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 i7
Edition : 22.3.90
Replaces : -
Test oil : ISO-4113

Combination no. : 9 400 231 179

Injection pump
Pump designation : PES6P120A720RS7011
Governor
Governor design. : RQV300...850PA701K

Cust. part no. : *

Customer-spec. information
Customer : MACK

Engine : EM 6-300 L-4VH

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 2 417 413 011

Inlet press., bar : 0.3

Opening
pressure, bar : 300...308

Test lines : 9 681 230 735

Outside diameter
x Wall thickness
x Length mm : 6.35X1.70X838.2

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.2...3.3
: (3.15...3.35)
Rack travel in mm : 8.00...9.00
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 10.60...10.70

Del.quantity cm³/ : 19.1...19.3

100 s : (-)

Spread cm³ : 0.6

100 s : (0.9)

2nd speed rpm : 300
Rack travel in mm : 4.70
Del.quantity cm³/ : 1.7...2.3
100 s : (-)

Spread cm³ : 0.75
100 s : (1.05)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 965

Rack travel in mm : 9.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 191.0...193.0

1000 : (189.0...195.0)

RATED SPEED

1st version

Control lever

position degrees: 57...61

Testing:

1st rack travel in: 9.60

Speed rpm : 895...905

2nd rack travel in: 4.00

Speed rpm : 970...1000

4th rack travel in: 1050

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 15...19

Testing:

Speed rpm : 250

Minimum rack travel: 6.50

Speed rpm : 400

Rack travel in mm : 2.00...3.40

Rack travel in mm : 2.00

Speed rpm : 400...460

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 850
Rack travel in m: 10.60...10.70
2nd speed rpm : 800
Rack travel in m: 10.95...11.05
3rd speed rpm : 700
Rack travel in m: 12.00...12.10
4th speed rpm : 510
Rack travel in m: 15.80...15.90
5th speed rpm : 450
Rack travel in m: 15.70...15.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm3/ : 220.0...225.0
1000 s: (218.0...227.0)
Speed rpm : 510
Del.quantity cm3/ : 284.0...290.0
1000 s: (282.0...292.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.60
Speed rpm : 895...905

STARTING FUEL DELIVERY

Speed rpm : 200
Del.quantity cm3/ : 140.0...200.0
1000 s: (-)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 17.0...23.0
Del.quantity cm3/ : (17.0...23.0)
1000 s: (15.0...25.0)

Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 i5
Edition : 22.3.90
Replaces : -
Test oil : ISO-4113

Combination no. : 9 400 231 179

Injection pump
Pump designation : PES6P120A720RS7011
Governor
Governor design. : RQV325...875PA701K

Cust. part no. : *

Customer-spec. information
Customer : MACK

Engine : EM 6-300 L-4VH

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 2 417 413 011

Inlet press., bar : 0.3

Opening
pressure, bar : 300...308

Test lines : 9 681 230 735

Outside diameter
x Wall thickness
x Length mm : 6.35X1.70X838.20

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.2...3.3
: (3.15...3.35)

Rack travel in mm : 8.00...9.00
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 18.8...19.0

100 s: (-)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 325
Rack travel in mm : 5.10...5.30
Del.quantity cm3/ : 3.3...3.7

100 s: (-)

Spread cm3 : 0.75
100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1

Speed rpm : 965
Rack travel in mm : 9.00...9.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 875
Del.quantity : 188.0...190.0
1000 : (185.0...193.0)

RATED SPEED

1st version
Control lever
position degrees: 57...61

Testing:
1st rack travel in: 9.40
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 985...1015
4th rack travel in: 1050
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 15...19

Testing:
Speed rpm : 275
Minimum rack travel: 6.90
Speed rpm : 400
Rack travel in mm : 2.70...4.10
Rack travel in mm : 2.00
Speed rpm : 435...510

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 875
Rack travel in m: 10.40...10.50
2nd speed rpm : 700
Rack travel in m: 11.90...12.10
3rd speed rpm : 600
Rack travel in m: 14.40...14.50
4th speed rpm : 510
Rack travel in m: 15.70...15.80
5th speed rpm : 450
Rack travel in m: 15.10...15.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm³/ : -
1000 s: (281.0...293.0)
Speed rpm : 510
Del.quantity cm³/ : 283.0...291.0
1000 s: (281.0...293.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...220.0
1000 s: (150.0...230.0)

LOW IDLE

Speed rpm : 325
Rack travel in mm : 33.0...37.0
Del.quantity cm³/ : (31.0...39.0)

Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 L
Edition : 26.3.90
Replaces : -
Test oil : ISO-4113
Combination no. : 9 400 231 183
Injection pump
Pump designation : PES6P110A72ORS6015
Governor
Governor design. : RQV300/600...1050PA
587-3K

Cust. part no. : *

Customer-spec. information
Customer : MACK

Engine : EM6 - 237

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.5

Opening
pressure, bar : 300...308

Test lines : 9 681 230 727

Outside diameter
x Wall thickness
x Length mm : 6.35X1.70X990.60

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.2...3.3
: (3.15...3.35)
Rack travel in mm : 11.50
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.50

Del.quantity cm³/ : 13.4...13.6

100 s: (-)

Spread cm³ : 0.4

100 s: (0.6)

2nd speed rpm : 300

Rack travel in mm : 5.0

Del.quantity cm³/ : 2.25...2.75

100 s: (-)

Spread cm³ : 0.45

100 s: (0.75)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 134.0...136.0

1000 : (132.0...138.0)

RATED SPEED

1st version

Control lever

position degrees: 57.5...65.5

Testing:

1st rack travel in: 10.50

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1175...1205

4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 16.5...21.5

Testing:

Speed rpm : 250

Minimum rack trave: 9.00

Speed rpm : 400

Rack travel in mm : 5.90...7.30

Rack travel in mm : 2.00

Speed rpm : 690...750

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050
Rack travel in m: 11.49...11.51
2nd speed rpm : 900
Rack travel in m: 11.40...11.50
3rd speed rpm : 800
Rack travel in m: 11.35...11.45
4th speed rpm : 700
Rack travel in m: 11.55...11.65
5th speed rpm : 500
Rack travel in m: 11.60...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm3/ : 145.0...150.0
1000 s: (143.0...152.0)
Speed rpm : 600
Del.quantity cm3/ : 176.0...180.0
1000 s: (174.0...182.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.50
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...175.0
1000 s: (-)
Rack travel in mm : 10.70...10.90

LOW IDLE

Speed rpm : 300
Rack travel in mm : 22.50...27.50
Del.quantity cm3/ : (20.50...29.50)

Remarks:

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 L1
 Edition : 27.3.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 185
 Injection pump
 Pump designation : PES6P110A720RS6015
 Governor
 Governor design. : RQV300/600...1050PA
 621-9K

Cust. part no. : *

Customer-spec. information
 Customer : MACK

Engine : EM6-250

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Inlet press., bar : 1.5

Opening
 pressure, bar : 300...308

Test lines : 9 681 230 272

Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X990.6

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.2...3.3
 : (3.15...3.35)
 Rack travel in mm : 11.00
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050
 Rack travel in mm : 11.00
 Del.quantity cm³/ : 13.9...14.1
 100 s : (-)

Spread cm³ : 0.4
 100 s : (0.6)

2nd speed rpm : 300
 Rack travel in mm : 4.00
 Del.quantity cm³/ : 2.25...2.75
 100 s : (-)
 Spread cm³ : 0.45
 100 s : (0.75)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1125
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Del.quantity : 139.0...141.0
 1000 : (137.0...143.0)

RATED SPEED

1st version
 Control lever
 position degrees: 56.5...61.5

Testing:
 1st rack travel in: 10.00
 Speed rpm : 1090...1100
 2nd rack travel in: 4.00
 Speed rpm : 1160...1190
 4th rack travel in: 1230
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 17.5...22.5

Testing:
 Speed rpm : 250
 Minimum rack trave: 9.00
 Speed rpm : 400
 Rack travel in mm : 6.10...7.50
 Rack travel in mm : 2.00
 Speed rpm : 710...770

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050
Rack travel in m: 11.00
2nd speed rpm : 1000
Rack travel in m: 10.95...11.05
3rd speed rpm : 850
Rack travel in m: 11.15...11.25
4th speed rpm : 630
Rack travel in m: 11.45...11.55
5th speed rpm : 500
Rack travel in m: 10.80...1090

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 850
Del.quantity cm3/ : 150.5...155.5
1000 s: (148.5...157.5)
Speed rpm : 630
Del.quantity cm3/ : 180.0...184.0
1000 s: (178.0...186.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...170.0
1000 s: (120.0...180.0)
Rack travel in mm : 9.20...9.40

HIGH IDLE

1st version

Speed rpm : 1180
Rack travel in mm : 3.90

LOW IDLE

Speed rpm : 300
Del.quantity cm3/ : 22.5...27.5
1000 s: (20.5...29.5)

Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,0 w3
 Edition : 2.4.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 231 187
 Injection pump
 Pump designation : PES6P110A720RS6005-1
 Governor
 Governor design. : RQV300/600...1050PA
 586-3K

Cust. part no. : *

Customer-spec. information
 Customer : MACK

Engine : EM6-285

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 0.3

Test nozzle holder
 assembly : *

Opening
 pressure, bar : 300...308

Test lines : 9 681 230 727

Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X990.6

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.8...2.9
 : (2.75...2.95)

Rack travel in mm : 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.5 (0.75)

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 16.0...16.2

100 s : (15.8...16.4)

Spread cm3 : 0.5

100 s : (0.75)

2nd speed rpm : 300

Rack travel in mm : 4.40...4.60

Del.quantity cm3/ : 2.4...2.9

100 s : (2.2...2.9)

Spread cm3 : 0.7

100 s : (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 160.5...162.5

1000 : (158.5...164.5)

RATED SPEED

1st version

Control lever

position degrees: 56.5...61.5

Testing:

1st rack travel in: 12.20

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1185...1215

4th rack travel in: 1240

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 14.5...19.5

Testing:

Speed rpm : 250

Minimum rack travel: 8.90

Speed rpm : 400

Rack travel in mm : 5.40...6.80
Rack travel in mm : 2.00
Speed rpm : 670...730

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050
Rack travel in m: 13.20...13.30
2nd speed rpm : 1000
Rack travel in m: 13.15...13.25
3rd speed rpm : 700
Rack travel in m: 13.75...13.85
4th speed rpm : 600
Rack travel in m: 14.15...14.25
5th speed rpm : 500
Rack travel in m: 13.65...13.75

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm³/ : 184.0...189.0
1000 s: (182.0...191.0)
Speed rpm : 600
Del.quantity cm³/ : 222.5...226.5
1000 s: (220.0...228.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...200.0
1000 s: (150.0...210.0)
Rack travel in mm : 10.60...10.70

LOW IDLE

Speed rpm : 300
Rack travel in mm : 24.5...29.5
Del.quantity cm³/ : (22.5...31.5)

Remarks:

: MACK #313 GC 5148 P
: 31

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to test-

G14

ing of the injection-pump assembly with
the genuine engine/nozzle-and-holder
assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 i2
Edition : 23.3.90
Replaces : -
Test oil : ISO-4113

Combination no. : 9 400 231 193

Injection pump
Pump designation : PES6P120A720RS7011
Governor
Governor design. : RQV300...850PA721K

Cust. part no. : *

Customer-spec. information
Customer : MACK

Engine : EM 6-300 L 4VH

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 2 417 413 011

Inlet press., bar : 0.3

Opening
pressure, bar : 295...305

Test lines : 9 681 230 735

Outside diameter
x Wall thickness
x Length mm : 6.35X1.70X838.2

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.20...3.30
: (3.15...3.35)
Rack travel in mm : 8.00...9.00
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 10.60...10.70

Del.quantity cm³/ : 191.0...193.0

100 s: (-)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 300

Rack travel in mm : 4.60...4.80

Del.quantity cm³/ : 17.0...23.0

100 s: (-)

Spread cm³ : 0.75

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-Lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 191.0...193.0

1000 : (189.0...195.0)

RATED SPEED

1st version

Control lever

position degrees: 57...61

Testing:

1st rack travel in: 9.60

Speed rpm : 895...905

2nd rack travel in: 4.00

Speed rpm : 970...1000

4th rack travel in: 1050

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 15...19

Testing:

Speed rpm : 250

Minimum rack travel: 6.50

Speed rpm : 400

Rack travel in mm : 2.00...3.40

Rack travel in mm : 2.00

Speed rpm : 400...460

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 850
Rack travel in m: 10.60...10.70
2nd speed rpm : 700
Rack travel in m: 12.00...12.10
3rd speed rpm : 510
Rack travel in m: 15.80...15.90
4th speed rpm : 450
Rack travel in m: 15.70...15.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm³/ : —
1000 s: (218.0...227.0)
Speed rpm : 510
Del.quantity cm³/ : 284.0...290.0
1000 s: (282.0...292.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.60
Speed rpm : 895...905

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...200.0
1000 s: (130.0...210.0)

LOW IDLE

Speed rpm : 300
Del.quantity cm³/ : 17.0...23.0
1000 s: (15.0...25.0)

Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 i3
 Edition : 23.3.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 193
 Injection pump
 Pump designation : PES6P120A720RS7011
 Governor
 Governor design. : RQV325...875PA721K
 Cust. part no. : *
 Customer-spec. information
 Customer : MACK
 Engine : EM 6-300 L 4VH

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 011
 Inlet press., bar : 0.3
 Test nozzle holder
 assembly : *
 Opening
 pressure, bar : 295...305
 Test Lines : 9 681 230 735
 Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X838.2
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.20...3.30
 : (3.15...3.35)
 Rack travel in mm : 8.00...9.00
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 875
 Rack travel in mm : 10.40...10.50
 Del.quantity cm³/ : 18.8...19.0
 100 s : (18.5...19.3)
 Spread cm³ : 0.6
 100 s : (0.9)
 2nd speed rpm : 325
 Rack travel in mm : 5.10...5.30
 Del.quantity cm³/ : 3.3...3.7
 100 s : (3.1...3.9)
 Spread cm³ : 0.75
 100 s : (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1020
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 875
 Del.quantity : 188.0...190.0
 1000 : (185.0...193.0)
 Spread cm³ : 6.0
 1000 : (9.0)

RATED SPEED

1st version
 Control lever
 position degrees: 57...61

Testing:
 1st rack travel in: 9.40
 Speed rpm : 915...925
 2nd rack travel in: 4.00
 Speed rpm : 985...1015
 4th rack travel in: 1050
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 15...19

Testing:
 Speed rpm : 275
 Minimum rack travel: 7.00

Speed rpm : 400
Rack travel in mm : 2.70...4.10
Rack travel in mm : 2.00
Speed rpm : 435...510

TORQUE CONTROL

Dimension a mm : 5.3
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 10.40...10.50
2nd speed rpm : 700
Rack travel in m: 12.00...12.20
3rd speed rpm : 600
Rack travel in m: 14.40...14.50
4th speed rpm : 510
Rack travel in m: 15.70...15.80
5th speed rpm : 450
Rack travel in m: 15.10...15.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm³/ : —
1000 s: (219.5...228.5)
Speed rpm : 510
Del.quantity cm³/ : 283.0...291.0
1000 s: (281.0...293.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...220.0
1000 s: (150.0...230.0)

LOW IDLE

Speed rpm : 325
Del.quantity cm³/ : 33.0...37.0
1000 s: (31.0...39.0)

Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with

G18

the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,0 x8
Edition : 3.4.90
Replaces : -
Test oil : ISO-4113
Combination no. : 9 400 231 199
Injection pump
Pump designation : PES6P110A72ORS6006
Governor
Governor design. : RQV300/600...950PA
621-10K

Cust. part no. : *

Customer-spec. information
Customer : MACK

Engine : EME 6-250 R

TEST BENCH REQUIREMENTS

Test oil
Outlet temp, °C : 40...45
Overflow valve : 2 417 413 011

Inlet press., bar : 1.5

Test nozzle holder
assembly : *

Opening
pressure, bar : 300...308

Test lines : 0 681 230 710

Outside diameter
x Wall thickness : 6.35X1.70X915.0
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.2...3.3
(3.15...3.35)
Rack travel in mm : 10.50
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.5 (0.75)

BASIC SETTING

1st speed rpm : 950
Rack travel in mm : 11.75
Del. quantity cm3/ : 15.1...15.3
100 s : (14.9...15.5)

Spread cm3 : 0.4
100 s : (-)

2nd speed rpm : 300
Rack travel in mm : 5.15...5.35
Del. quantity cm3/ : 2.3...2.8
100 s : (-)
Spread cm3 : 0.4
100 s : (-)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1020
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 950
Del. quantity : 151.0...153.0
1000 : (149.0...155.0)
Spread cm3 : 4.0
1000 : (-)

RATED SPEED

1st version
Control lever
position degrees: 61.0...66.0

Testing:
1st rack travel in: 10.90
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1125
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 18...23

Testing:
Speed rpm : 250

Minimum rack trave: 9.60
Speed rpm : 400
Rack travel in mm : 3.80...5.20
Rack travel in mm : 2.00
Speed rpm : 560...620

TORQUE CONTROL

Dimension a mm : 0.85
Torque control curve - 1st version
1st speed rpm : 950
Rack travel in m: 11.90
2nd speed rpm : 850
Rack travel in m: 12.05...12.15
3rd speed rpm : 750
Rack travel in m: 12.30...12.40
4th speed rpm : 630
Rack travel in m: 12.75...12.85
5th speed rpm : 500
Rack travel in m: 12.00...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 850
Del.quantity cm3/ : 160.5...165.5
1000 s: (158.5...167.5)
Speed rpm : 630
Del.quantity cm3/ : 187.5...191.5
1000 s: (185.5...193.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.90
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...170.0
1000 s: (-)
Rack travel in mm : 10.10...10.30

LOW IDLE

Speed rpm : 300
Del.quantity cm3/ : 23.5...28.5
1000 s: (-)

Remarks:

: MACK # 313 GC 5151 P
: 8

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 j
Edition : 23.3.90
Replaces : -
Test oil : ISO-4113
Combination no. : 9 400 231 201
Injection pump
Pump designation : PES6P120A72ORS6016-1
Governor
Governor design. : RQV300...850PA737K

Cust. part no. : *

Customer-spec. information
Customer : MACK

Engine : E6-300 4VH

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 2 417 413 011

Inlet press., bar : 0.3

Test nozzle holder
assembly : *

Opening
pressure, bar : 295...305

Test lines : 9 681 230 735

Outside diameter
x Wall thickness
x Length mm : 6.35X1.70X838.2

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.95...3.05
 : (2.90...3.10)
Rack travel in mm : 10.50
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.40...13.50

Del.quantity cm³/ : 18.3...18.5

100 s : (18.1...18.7)

Spread cm³ : 0.5

100 s : (0.75)

2nd speed rpm : 325

Rack travel in mm : 4.70...4.90

Del.quantity cm³/ : 2.9...3.5

100 s : (2.7...3.7)

Spread cm³ : 1.0

100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 183.5...185.5

1000 : (181.5...187.5)

RATED SPEED

1st version

Control lever

position degrees: 58.5...63.5

Testing:

1st rack travel in: 12.40

Speed rpm : 885...895

2nd rack travel in: 4.00

Speed rpm : 975...1005

4th rack travel in: 1050

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 17.5...22.5

Testing:

Speed rpm : 250

Minimum rack travel: 8.70

Speed rpm : 400

Rack travel in mm : 4.00...5.40

Rack travel in mm : 2.00
Speed rpm : 540...600

assembly

TORQUE CONTROL

Dimension a mm : 0.85
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 13.40...13.50
2nd speed rpm : 700
Rack travel in m: 13.80...13.90
3rd speed rpm : 600
Rack travel in m: 14.25...14.35
4th speed rpm : 500
Rack travel in m: 13.75...13.85

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm3/ : —
1000 s: (199.0...209.0)
Speed rpm : 600
Del.quantity cm3/ : 219.0...224.0
1000 s: (217.0...226.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.40
Speed rpm : 885...895

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 180.0...220.0
1000 s: (170.0...230.0)
Rack travel in mm : 11.60...11.80

LOW IDLE

Speed rpm : 325
Del.quantity cm3/ : 29.0...35.0
1000 s: (27.0...37.0)

Remarks:

: MACK # 313 GC 5150
: P9

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to test-
ing of the injection-pump assembly with
the genuine engine/nozzle-and-holder

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 j1
 Edition : 23.3.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 203
 Injection pump
 Pump designation : PES6P120A72ORS6016-1
 Governor
 Governor design. : RQV300...850PA737-1K
 Cust. part no. : *
 Customer-spec. information
 Customer : MACK
 Engine : E6-275

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 011
 Inlet press., bar : 0.3
 Test nozzle holder
 assembly : *
 Opening
 pressure, bar : 295...305
 Test lines : 9 681 230 735
 Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X838.2
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.95...3.05
 : (2.90...3.10)
 Rack travel in mm : 10.50
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 850
 Rack travel in mm : 13.30...13.40
 Del. quantity cm³/ : 16.7...16.9
 100 s : (16.5...17.1)
 Spread cm³ : 0.45
 100 s : (0.75)
 2nd speed rpm : 300
 Rack travel in mm : 5.30...5.50
 Del. quantity cm³/ : 2.2...2.8
 100 s : (2.0...3.0)
 Spread cm³ : 0.75
 100 s : (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1020
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Del. quantity : 167.0...169.0
 1000 : (165.0...171.0)

RATED SPEED

1st version
 Control Lever
 position degrees: 56.5...61.5

Testing:
 1st rack travel in: 12.30
 Speed rpm : 890...900
 2nd rack travel in: 4.00
 Speed rpm : 975...1005
 4th rack travel in: 1050
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 15.5...20.5

Testing:
 Speed rpm : 250
 Minimum rack travel: 8.70
 Speed rpm : 400
 Rack travel in mm : 4.30...5.70

Rack travel in mm : 2.00
Speed rpm : 560...620

TORQUE CONTROL

Dimension a mm : 0.85
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 13.30...13.40
2nd speed rpm : 700
Rack travel in m: 13.70...13.80
3rd speed rpm : 600
Rack travel in m: 14.15...14.25
4th speed rpm : 500
Rack travel in m: 13.65...13.75

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm3/ : —
1000 s: (180.0...190.0)
Speed rpm : 600
Del.quantity cm3/ : 202.0...207.0
1000 s: (199.5...209.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.30
Speed rpm : 890...900

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...200.0
1000 s: (150.0...210.0)

LOW IDLE

Speed rpm : 300
Del.quantity cm3/ : 22.0...28.0
1000 s: (20.0...30.09)

Remarks:

: MACK # 313 GC 5150
: P11

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 10,9 c2
 Edition : 3.4.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 207
 Injection pump
 Pump designation : PES6P110A720RS6008-1
 Governor
 Governor design. : RQV300/500...975PA
 591-5K

Cust. part no. : *

Customer-spec. information
 Customer : MACK

Engine : EE6-350/SCAC

TEST BENCH REQUIREMENTS

Test oil
 Outlet temp, °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.5

Test nozzle holder
 assembly : *

Opening
 pressure, bar : 300...308

Test lines : 9 681 230 710

Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X990.6

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.20...3.30
 : (3.15...3.35)
 Rack travel in mm : 10.50
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.5 (0.75)

BASIC SETTING

1st speed rpm : 975
 Rack travel in mm : 14.50...14.60
 Del.quantity cm³/ : 20.9...21.1
 100 s : (20.7...21.3)
 Spread cm³ : 0.45
 100 s : (0.75)

2nd speed rpm : 300
 Rack travel in mm : 5.30...5.50
 Del.quantity cm³/ : 1.7...2.3
 100 s : (1.5...2.5)
 Spread cm³ : 0.55
 100 s : (0.8)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1020
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 975
 Del.quantity : 209.0...211.0
 1000 : (207.0...213.0)
 Spread cm³ : 4.5
 1000 : (7.5)

LOW IDLE 1

Control lever
 position degrees: 17.5...22.5

Testing:

Speed rpm : 250
 Minimum rack trave: 9.80
 Speed rpm : 400
 Rack travel in mm : 4.20...5.60
 Rack travel in mm : 2.00
 Speed rpm : 710...770

TORQUE CONTROL

Dimension a mm : 1.50
 Torque control curve - 1st version
 1st speed rpm : 975
 Rack travel in m: 14.50
 2nd speed rpm : 900
 Rack travel in m: 14.45...14.55
 3rd speed rpm : 700

Rack travel in m: 14.65...14.75
4th speed rpm : 650
Rack travel in m: 14.15...14.25
5th speed rpm : 500
Rack travel in m: 13.15...13.25

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 700
Del.quantity cm3/ : 234.5...239.5
1000 s: (232.5...241.5)
Speed rpm : 650
Del.quantity cm3/ : 231.0...237.0
1000 s: (229.0...239.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.50
Speed rpm : 1015...1025

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...170.0
1000 s: (120.0...180.0)

LOW IDLE

Speed rpm : 300
Del.quantity cm3/ : 17.0...23.0
1000 s: (15.0...25.0)

Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 k
Edition : 23.3.90
Replaces : -
Test oil : ISO-4113

Combination no. : 9 400 231 209

Injection pump
Pump designation : PES6P120A720RS6061-1
Governor
Governor design. : RQV300...850PA721-1K

Cust. part no. : *

Customer-spec. information
Customer : MACK

Engine : E6-275-4VH

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 0.3

Test nozzle holder
assembly : *

Opening
pressure, bar : 295...305

Test lines : 9 681 230 735

Outside diameter
x Wall thickness
x Length mm : 6.35x1.70x838.2

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.95...3.05
: (2.90...3.10)
Rack travel in mm : 10.50
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.30...13.40

Del.quantity cm³/ : 16.7...16.9
100 s : (16.5...17.1)

Spread cm³ : 0.45
100 s : (0.75)

2nd speed rpm : 300
Rack travel in mm : 5.30...5.50
Del.quantity cm³/ : 2.2...2.8
100 s : (2.0...3.0)

Spread cm³ : 0.75
100 s : (1.0)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1020
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 850
Del.quantity : 167.0...169.0
1000 : (165.0...171.0)

RATED SPEED

1st version
Control lever
position degrees: 56.5...61.5

Testing:
1st rack travel in: 12.30
Speed rpm : 890...900
2nd rack travel in: 4.00
Speed rpm : 975...1005
4th rack travel in: 1050
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 15.5...20.5

Testing:
Speed rpm : 250
Minimum rack travel: 8.70
Speed rpm : 400
Rack travel in mm : 4.30...5.70

Rack travel in mm : 2.00
Speed rpm : 560...620

TORQUE CONTROL

Dimension a mm : 0.85
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 13.30...13.40
2nd speed rpm : 700
Rack travel in m: 13.70...13.80
3rd speed rpm : 600
Rack travel in m: 14.15...14.25
4th speed rpm : 500
Rack travel in m: 13.65...13.75

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm3/ : —
1000 s: (180.0...190.0)
Speed rpm : 600
Del.quantity cm3/ : 202.0...207.0
1000 s: (199.5...209.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.30
Speed rpm : 890...900

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...170.0
1000 s: (120.0...180.0)
Rack travel in mm : 11.50...11.70

LOW IDLE

Speed rpm : 300
Del.quantity cm3/ : 22.0...28.0
1000 s: (20.0...30.0)

Remarks:

:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 j2
 Edition : 23.3.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 211
 Injection pump
 Pump designation : PES6P120A72ORS6016-1
 Governor
 Governor design. : RQV300...850PA721-2K
 Cust. part no. : *
 Customer-spec. information
 Customer : MACK
 Engine : E6-300 4VH

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 011
 Inlet press., bar : 0.3
 Test nozzle holder
 assembly : *
 Opening
 pressure, bar : 295...305

Test lines : 9 681 230 735
 Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X838.3

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.95...3.05
 : (2.90...3.10)
 Rack travel in mm : 10.50
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 850
 Rack travel in mm : 13.40...13.50
 Del.quantity cm3/ : 18.3...18.5
 100 s : (18.1...18.7)
 Spread cm3 : 0.5
 100 s : (0.75)
 2nd speed rpm : 325
 Rack travel in mm : 4.70...4.90
 Del.quantity cm3/ : 2.9...3.5
 100 s : (2.7...3.7)
 Spread cm3 : 1.0
 100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1020
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Del.quantity : 183.5...185.5
 1000 : (181.5...187.5)
 Spread cm3 : 5.0
 1000 : (7.5)

RATED SPEED

1st version
 Control lever
 position degrees: 58.5...63.5

Testing:
 1st rack travel in: 12.40
 Speed rpm : 885...895
 2nd rack travel in: 4.00
 Speed rpm : 975...1005
 4th rack travel in: 1050
 Speed rpm : 0.00...1.00

LOW IDLE 1
 Control lever
 position degrees: 17.5...22.5

Testing:
 Speed rpm : 250
 Minimum rack trave: 8.70

Speed rpm : 400
Rack travel in mm : 4.00...5.40
Rack travel in mm : 2.00
Speed rpm : 540...600

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 850
Rack travel in m: 13.40...13.50
2nd speed rpm : 700
Rack travel in m: 13.80...13.90
3rd speed rpm : 600
Rack travel in m: 14.25...14.35
4th speed rpm : 500
Rack travel in m: 13.75...13.85

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm³/ : —
1000 s: (199.0...209.0)
Speed rpm : 600
Del.quantity cm³/ : 219.0...224.0
1000 s: (217.0...226.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.40
Speed rpm : 885...895

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 180.0...220.0
1000 s: (170.0...230.0)
Rack travel in mm : 12.00...12.20

LOW IDLE

Speed rpm : 325
Del.quantity cm³/ : 29.0...35.0
1000 s: (27.0...37.0)

Remarks:

: MACK #313 GC 5150 P
: 15

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to test-
ing of the injection-pump assembly with

H02

the genuine engine/nozzle-and-holder
assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,0 w2
 Edition : 3.4.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 219
 Injection pump
 Pump designation : PES6P110A72ORS6005-1
 Governor
 Governor design. : RQV300...1050PA586-4K

Cust. part no. : *

Customer-spec. information
 Customer : MACK

Engine : EM6-285

TEST BENCH REQUIREMENTS

Test oil
 Outlet temp, °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 0.3

Test nozzle holder
 assembly : *

Opening
 pressure, bar : 300...308

Test lines : 9 681 230 727

Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X990.6

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.8...2.9
 : 2.75...2.95
 Rack travel in mm : 10.50
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.5 (0.75)

BASIC SETTING

1st speed rpm : 1050
 Rack travel in mm : 13.10...13.20
 Del.quantity cm3/ : 16.8...17.0
 100 s : (16.6...17.2)
 Spread cm3 : 0.5
 100 s : (0.75)

2nd speed rpm : 325
 Rack travel in mm : 4.30...4.50
 Del.quantity cm3/ : 2.9...3.4
 100 s : (2.7...3.6)
 Spread cm3 : 0.7
 100 s : (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1020
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Del.quantity : 168.0...170.0
 1000 : (166.0...172.0)
 Spread cm3 : 5.0
 1000 : (7.5)

RATED SPEED

1st version
 Control lever
 position degrees: 57.5...62.5

Testing:
 1st rack travel in: 12.10
 Speed rpm : 1090...1100
 2nd rack travel in: 4.00
 Speed rpm : 1190...1220
 4th rack travel in: 1275
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 16.5...21.5

Testing:
 Speed rpm : 275

Minimum rack trave: 8.90
Speed rpm : 425
Rack travel in mm : 6.10...7.50
Rack travel in mm : 2.00
Speed rpm : 735...795

assembly

TORQUE CONTROL

Dimension a mm : 0.85
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 13.10...13.20
2nd speed rpm : 800
Rack travel in m: 12.90...13.10
3rd speed rpm : 600
Rack travel in m: 13.75...13.85
4th speed rpm : 500
Rack travel in m: 13.40...13.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm3/ : -
1000 s: (184.5...193.5)
Speed rpm : 600
Del.quantity cm3/ : 222.0...226.0
1000 s: (220.0...228.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...180.0
1000 s: (130.0...190.0)

LOW IDLE

Speed rpm : 325
Del.quantity cm3/ : 29.5...34.5
1000 s: (27.5...36.5)

Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to test-
ing of the injection-pump assembly with
the genuine engine/nozzle-and-holder

H04

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 j3
 Edition : 23.3.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 221
 Injection pump
 Pump designation : PES6P120A720RS6016-2
 Governor
 Governor design. : RQV325...900PA773K
 Cust. part no. : *
 Customer-spec. information
 Customer : MACK
 Engine : EE6-350-4-VM

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 011
 Inlet press., bar : 0.3
 Test nozzle holder
 assembly : *
 Opening
 pressure, bar : 295...305
 Test lines : 9 681 230 735
 Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X838.2
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.85...2.95
 : (2.80...3.00)
 Rack travel in mm : 10.50
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 325
 Rack travel in mm : 15.65...15.75
 Del.quantity cm³/ : 20.9...21.1
 100 s: (20.7...21.3)
 Spread cm³ : 0.5
 100 s: (0.75)
 2nd speed rpm : 900
 Rack travel in mm : 5.70...5.90
 Del.quantity cm³/ : 2.9...3.5
 100 s: (2.7...3.7)
 Spread cm³ : 1.0
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1020
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900
 Del.quantity : 209.0...211.0
 1000 : (207.0...213.0)
 Spread cm³ : 5.0
 1000 : (7.5)

RATED SPEED

1st version
 Control lever
 position degrees: 58.5...63.5

Testing:
 1st rack travel in: 14.65
 Speed rpm : 940...950
 2nd rack travel in: 4.00
 Speed rpm : 1065...1095
 4th rack travel in: 1150
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 20...25

Testing:
 Speed rpm : 275
 Minimum rack trave: 8.60

Speed rpm : 425
Rack travel in mm : 5.80...7.20
Rack travel in mm : 2.00
Speed rpm : 670...730

the genuine engine/nozzle-and-holder
assembly

TORQUE CONTROL

Dimension a mm : 1.15
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 15.65...15.75
2nd speed rpm : 700
Rack travel in m: 15.95...16.05
3rd speed rpm : 625
Rack travel in m: 16.00...16.10
4th speed rpm : 500
Rack travel in m: 14.85...14.95

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm3/ : —
1000 s: (231.5...241.5)
Speed rpm : 625
Del.quantity cm3/ : 241.5...246.5
1000 s: (239.5...248.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.65
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 141.0...181.0
1000 s: (131.0...191.0)

LOW IDLE

Speed rpm : 325
Del.quantity cm3/ : 29.0...35.0
1000 s: (27.0...37.0)

Remarks:

: MACK # 313 GC 5150 P
: 17

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to test-
ing of the injection-pump assembly with

H06

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : Mac 11,1 l2
 Edition : 3.4.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 223
 Injection pump
 Pump designation : PES6P110A720RS6015-1
 Governor
 Governor design. : RQV325...1050PA587-4K
 Governor no. : *

Customer-spec. information
 Customer : MACK

Engine : EM6-237

TEST BENCH REQUIREMENTS

Test oil
 Outlet temp, °C : 38...42
 Overflow valve : 2 417 413 011
 Inlet press., bar : 0.3

Test nozzle holder
 assembly : *

Opening
 pressure, bar : 300...308

Test Lines : 9 681 230 727

Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X990.6

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.2...3.3
 : (3.15...3.35)
 Rack travel in mm : 1050
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.5 (0.75)

BASIC SETTING

1st speed rpm : 1050
 Rack travel in mm : 11.20...11.30
 Del.quantity cm3/ : 13.2...13.4
 100 s : (13.0...13.6)
 Spread cm3 : 0.4
 100 s : (0.6)
 2nd speed rpm : 325
 Rack travel in mm : 4.60...4.80
 Del.quantity cm3/ : 2.9...3.4
 100 s : (2.7...3.6)
 Spread cm3 : 0.45
 100 s : (0.75)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1020
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Del.quantity : 132.0...134.0
 1000 : (130.0...136.0)
 Spread cm3 : 4.0
 1000 : (6.0)

RATED SPEED

1st version
 Control lever
 position degrees: 55.5...60.5

Testing:
 1st rack travel in: 10.20
 Speed rpm : 1090...1100
 2nd rack travel in: 4.00
 Speed rpm : 1170...1200
 4th rack travel in: 1250
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 18.5...23.5

Testing:
 Speed rpm : 275
 Minimum rack trave: 8.90

Speed rpm : 425
Rack travel in mm : 6.10...7.50
Rack travel in mm : 2.00
Speed rpm : 750...810

assembly

TORQUE CONTROL

Dimension a mm : 0.95
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 11.20...11.30
2nd speed rpm : 800
Rack travel in m: 11.25...11.35
3rd speed rpm : 600
Rack travel in m: 12.15...12.25
4th speed rpm : 500
Rack travel in m: 11.75...11.85

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm3/ : -
1000 s: (144.5...153.5)
Speed rpm : 600
Del.quantity cm3/ : 179.5...183.5
1000 s: (177.5...185.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 142.0...182.0
1000 s: (132.0...192.0)

LOW IDLE

Speed rpm : 325
Del.quantity cm3/ : 29.5...34.5
1000 s: (27.5...36.5)

Remarks:

: MACK # 331GC5148P35

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection pump assembly with the genuine engine/nozzle-and-holder

H08

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 L3
Edition : 3.4.90
Replaces : -
Test oil : ISO-4113
Combination no. : 9 400 231 225
Injection pump
Pump designation : PES6P110A720RS6015-1
Governor
Governor design. : RQV325...1050PA721-3K

Cust. part no. : *

Customer-spec. information
Customer : MACK

Engine : EM6-237

TEST BENCH REQUIREMENTS

Test oil
Outlet temp, °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 0.3

Opening
pressure, bar : 300...308

Test lines : 9 681 230 727

Outside diameter
x Wall thickness
x Length mm : 6.35x1.70x990.6

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 3.2...3.3
: (3.15...3.35)
Rack travel in mm : 1050
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.5 (0.75)

H09

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.20...11.30

Del.quantity cm³/ : 13.2...13.4

100 s: (13.0...13.6)

Spread cm³ : 0.4

100 s: (0.6)

2nd speed rpm : 325

Rack travel in mm : 4.60...4.80

Del.quantity cm³/ : 2.9...3.4

100 s: (2.7...3.6)

Spread cm³ : 0.45

100 s: (0.75)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 132.0...134.0

1000 : (130.0...136.0)

Spread cm³ : 4.0

1000 : (6.0)

RATED SPEED

1st version

Control lever

position degrees: 55.5...60.5

Testing:

1st rack travel in: 1020

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1170...1200

Speed rpm : 1250

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 18.5...23.5

Testing:

Speed rpm : 275

Minimum rack travel: 8.90

Speed rpm : 425

Rack travel in mm : 6.10...7.50

Rack travel in mm : 2.00
Speed rpm : 750...810

TORQUE CONTROL

Dimension a mm : 0.95
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 11.20...11.30
2nd speed rpm : 800
Rack travel in m: 11.25...11.35
3rd speed rpm : 600
Rack travel in m: 12.15...12.25
4th speed rpm : 500
Rack travel in m: 11.75...11.85

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 800
Del.quantity cm³/ : -
1000 s: (144.5...153.5)
Speed rpm : 600
Del.quantity cm³/ : 179.5...183.5
1000 s: (177.5...185.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.20
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 142.0...182.0
1000 s: (132.0...192.0)
Rack travel in mm : 10.10...10.30

LOW IDLE

Speed rpm : 325
Del.quantity cm³/ : 29.5...34.5
1000 s: (27.5...36.5)

Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 j4
Edition : 23.3.90
Replaces : -
Test oil : ISO-4113
Combination no. : 9 400 231 227
Injection pump
Pump designation : PES6P120A72ORS6016-3
Governor
Governor design. : RQV325...1050PA621-12K

Cust. part no. : *

Customer-spec. information
Customer : MACK

Engine : EM6-300-4VH

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 0.2

Test nozzle holder
assembly : *

Opening
pressure, bar : 295...305

Test lines : 9 681 230 735

Outside diameter
x Wall thickness
x Length mm : 6.35x1.70x838.2

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.95...3.05
(2.90...3.10)

Rack travel in mm : 10.50
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.30...13.40

Del.quantity cm³/ : 16.1...16.3

100 s : (15.8...16.6)

Spread cm³ : 0.6

100 s : (0.9)

2nd speed rpm : 325

Rack travel in mm : 5.70...5.90

Del.quantity cm³/ : 3.0...3.4

100 s : (2.8...3.7)

Spread cm³ : 0.75

100 s : (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 161.0...163.0

1000 : (158.0...166.0)

Spread cm³ : 6.0

1000 : (9.0)

RATED SPEED

1st version

Control lever

position degrees: 58...62

Testing:

1st rack travel in: 12.30

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1205...1235

4th rack travel in: 1290

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 15...19

Testing:

Speed rpm : 250

Minimum rack travel: 8.00
Speed rpm : 400
Rack travel in mm : 3.60...5.00
Rack travel in mm : 2.00
Speed rpm : 515...595

TORQUE CONTROL

Dimension a mm : 1.40
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 13.30...13.40
2nd speed rpm : 800
Rack travel in m: 13.70...13.90
3rd speed rpm : 700
Rack travel in m: 14.20...14.40
4th speed rpm : 630
Rack travel in m: 14.70...14.80
5th speed rpm : 500
Rack travel in m: 14.20...14.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm³/ : —
1000 s: (182.0...192.0)
Speed rpm : 630
Del.quantity cm³/ : 219.0...225.0
1000 s: (216.0...228.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.30
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 155.0...215.0
1000 s: (145.0...225.0)

LOW IDLE

Speed rpm : 325
Del.quantity cm³/ : 30.0...34.0
1000 s: (28.0...37.0)

Remarks:

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with

H12

the genuine engine/nozzle-and-holder assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 j5
 Edition : 23.3.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 231
 Injection pump
 Pump designation : PES6P120A720RS6016-3
 Governor
 Governor design. : RQV325...1050PA721-4K
 Cust. part no. : *
 Customer-spec. information
 Customer : MACK
 Engine : EM6-300-4VH

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 011
 Inlet press., bar : 0.2
 Test nozzle holder
 assembly : *
 Opening
 pressure, bar : 295...305
 Test lines : 9 681 230 735
 Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X838.2

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.95...3.05
 : (2.90...3.10)
 Rack travel in mm : 10.50
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050
 Rack travel in mm : 13.30...13.40
 Del.quantity cm3/ : 16.1...16.3
 100 s : (15.8...16.6)
 Spread cm3 : 0.6
 100 s : (0.9)
 2nd speed rpm : 325
 Rack travel in mm : 5.70...5.90
 Del.quantity cm3/ : 3.0...3.4
 100 s : (2.8...3.7)
 Spread cm3 : 0.75
 100 s : (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1100
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Del.quantity : 161.0...163.0
 1000 : (158.0...166.0)
 Spread cm3 : 6.0
 1000 : (9.0)

RATED SPEED

1st version
 Control lever
 position degrees: 58...62

Testing:
 1st rack travel in: 12.30
 Speed rpm : 1090...1100
 2nd rack travel in: 4.00
 Speed rpm : 1205...1235
 4th rack travel in: 1290
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 15...19

Testing:
 Speed rpm : 250

Minimum rack trave: 8.90
Speed rpm : 400
Rack travel in mm : 3.60...5.00
Rack travel in mm : 2.00
Speed rpm : 515...595

TORQUE CONTROL

Dimension a mm : 1.40
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 13.30...13.40
2nd speed rpm : 800
Rack travel in m: 13.70...13.90
3rd speed rpm : 700
Rack travel in m: 14.20...14.40
4th speed rpm : 630
Rack travel in m: 14.70...14.80
5th speed rpm : 500
Rack travel in m: 14.20...14.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm3/ : —
1000 s: (183.0...191.0)
Speed rpm : 630
Del.quantity cm3/ : 219.0...225.0
1000 s: (216.0...225.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.30
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 155.0...215.0
1000 s: (145.0...225.0)

LOW IDLE

Speed rpm : 325
Del.quantity cm3/ : 30.0...34.0
1000 s: (28.0...37.0)

Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to test-

H14

ing of the injection-pump assembly with
the genuine engine/nozzle-and-holder
assembly

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,6 g 8
Edition : 01.02.90
Replaces : 7.4.89
Test oil : ISO-4113

Combination no. : 9 400 231 236

Injection pump
Pump designation : PES6P110A720RS3083-1
EP type number : 9 410 231 027
Governor
Governor design. : RSV475...1050P2A455-
3
Governor no. : 9 420 234 172

Customer-spec. information
Customer : JOHN DEERE

Engine : 6466A

1st version kW : 151.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 9 681 271 022

Outside diameter
x Wall thickness
x Length mm : 6.35X3.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.45...3.55
: (3.40...3.60)

Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.70...11.80

Del.quantity cm³/ : 13.6...13.9

100 s: (13.4...14.2)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 475.0
Rack travel in mm : 5.9...6.1
Del.quantity cm³/ : 1.4...1.9
100 s: (1.2...2.2)

Spread cm³ : 0.4
100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3

Speed rpm : 800
Rack travel in mm : 0.30...0.70

Governor spring pre-tension
Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Del.quantity : 136.5...139.5
1000 : (134.0...142.0)
Spread cm³ : 4.00
1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 38...46

Testing:
1st rack travel in: 10.70
Speed rpm : 1090...1100
2nd rack travel in: 4.00

Speed rpm : 1145...1155
3rd rack travel in: 4.00
Speed rpm : 1150...1170
4th rack travel in: 1250
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 18...26
Setting point w/out bumper spring
Speed rpm : 475
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 475
Rack travel in mm : 5.90...6.10

TORQUE CONTROL

Dimension a mm : 0.40
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 11.70...11.80
2nd speed rpm : 700
Rack travel in m: 12.10...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm³/ : 139.5...143.5
1000 s: (136.5...146.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.70
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...170.0
1000 s: (145.0...175.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 475
Rack travel in mm : 5.90...6.10
Del.quantity cm³/ : 14.5...19.5
1000 s: (12.0...22.0)
Spread cm³ : 4.50
1000 s: (7.50)

Remarks:

: JOHN DEERE # RE30252

Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Starting/full-load transition speed
from holding magnet = 450 1/min.

Start-of-delivery mark 12° cam angle
after start of delivery cyl. 1.

APPLICATION

Excavator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 j6
 Edition : 23.3.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 239
 Injection pump
 Pump designation : PES6P120A72ORS6016-1
 Governor
 Governor design. : RQV325...850PA737-3K
 Cust. part no. : *
 Customer-spec. information
 Customer : MACK
 Engine : E6 300 4VH

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve
 : 2 417 413 011
 Inlet press., bar : 0.2
 Test nozzle holder
 assembly : *
 Opening
 pressure, bar : 295...305
 Test lines : 9 681 230 735
 Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X838.2

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.95...3.05
 : (2.90...3.10)
 Rack travel in mm : 10.50
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850
 Rack travel in mm : 13.20...13.30
 Del. quantity cm3/ : 18.3...18.5
 100 s : (18.0...18.9)
 Spread cm3 : 0.5
 100 s : (0.75)
 2nd speed rpm : 325
 Rack travel in mm : 4.70...4.90
 Del. quantity cm3/ : 3.0...3.4
 100 s : (2.8...3.6)
 Spread cm3 : 1.0
 100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1020
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Del. quantity : 183.0...185.0
 1000 : (180.0...189.0)
 Spread cm3 : 5.0
 1000 : (7.5)

RATED SPEED

1st version
 Control lever
 position degrees: 52...58

Testing:
 1st rack travel in: 12.20
 Speed rpm : 890...900
 2nd rack travel in: 4.00
 Speed rpm : 995...1025
 4th rack travel in: 1050
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 10...16

Testing:

assembly

Speed rpm : 250
Minimum rack travel: 6.60
Speed rpm : 325
Rack travel in mm : 4.70...4.90
Rack travel in mm : 2.00
Speed rpm : 430...490

TORQUE CONTROL

Dimension a mm : 0.60
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 13.20...13.30
2nd speed rpm : 700
Rack travel in m: 13.40...13.50
3rd speed rpm : 600
Rack travel in m: 13.80...13.90
4th speed rpm : 500
Rack travel in m: 13.20...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm3/ : —
1000 s: (193.5...205.5)
Speed rpm : 600
Del.quantity cm3/ : 213.0...219.0
1000 s: (210.0...222.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20
Speed rpm : 890...900

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...200.0
1000 s: (150.0...210.0)

LOW IDLE

Speed rpm : 325
Del.quantity cm3/ : 30.0...34.0
1000 s: (28.0...36.0)

Remarks:

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 j7
 Edition : 23.3.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 231 241
 Injection pump
 Pump designation : PES6P120A720RS6016-1
 Governor
 Governor design. : RQS325...850PA721-5K
 Cust. part no. : *
 Customer-spec. information
 Customer : MACK
 Engine : E6 400 4VH

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 011
 Inlet press., bar : 0.2
 Opening
 pressure, bar : 295...305
 Test Lines : 1 680 750 015
 Outside diameter
 x Wall thickness
 x Length mm : 6.35X1.70X838.2

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Prestroke mm : 2.95...3.05
 : (2.90...3.10)
 Rack travel in mm : 10.50
 Firing order : 1-5-3-6-2-4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850
 Rack travel in mm : 13.20...13.30
 Del.quantity cm3/ : 18.3...18.5
 100 s : (18.0...18.9)
 Spread cm3 : 0.5
 100 s : (0.75)
 2nd speed rpm : 325
 Rack travel in mm : 4.70...4.90
 Del.quantity cm3/ : 3.0...3.4
 100 s : (2.8...3.6)
 Spread cm3 : 1.0
 100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1020
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Del.quantity : 183.0...185.0
 1000 : (180.0...189.0)
 Spread cm3 : 5.0
 1000 : (7.5)

RATED SPEED

1st version
 Control lever
 position degrees: 52...58

Testing:
 1st rack travel in: 12.20
 Speed rpm : 890...900
 2nd rack travel in: 4.00
 Speed rpm : 995...1025
 4th rack travel in: 1050
 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
 position degrees: 10...16

Testing:
 Speed rpm : 250
 Minimum rack trave: 6.60
 Speed rpm : 325

Rack travel in mm : 4.70...4.90
Rack travel in mm : 2.00
Speed rpm : 430...490

TORQUE CONTROL

Dimension a mm : 0.60
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 13.20...13.30
2nd speed rpm : 700
Rack travel in m: 13.40...13.50
3rd speed rpm : 600
Rack travel in m: 13.80...13.90
4th speed rpm : 500
Rack travel in m: 13.20...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm³/ : —
1000 s: (193.5...205.5)
Speed rpm : 600
Del.quantity cm³/ : 213.0...219.0
1000 s: (210.0...222.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20
Speed rpm : 890...900

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...200.0
1000 s: (150.0...210.0)

LOW IDLE

Speed rpm : 325
Del.quantity cm³/ : 30.0...34.0
1000 s: (28.0...36.0)

Remarks:

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to testing of the injection-pump assembly with the genuine engine/nozzle-and-holder assembly

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P7
Edition : 26.3.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R123
Type number : 0 460 424 006
Customer Part-No. : 3 917 640

Customer-specific information
Customer : CDC

Engine : 4 BT 390

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 016

Opening
pressure bar : 204...210

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm : 2.0
mm: +0.02(0.06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

H21

Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,5...5,1

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm3/
1000H.: 85,0...86,0
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 18,5...24,5
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340
Del.quantity cm3/
1000H.: 25,5...31,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 97,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 3,8...4,4
mm: (0,6...2,2)
2nd speed 1/min: 900
TD travel mm: 2,3...2,7
mm: (1,8...2,2)
3rd speed 1/min: 1100
TD travel mm: 3,1...3,9
mm: (2,9...4,3)

Supply-pump pressure characteristic:

1st speed 1/min: 750
Supply-pump
pressure bar: 3,8...4,4
bar: (3,6...4,6)
2nd speed 1/min: 900

Supply-pump pressure bar: 2,3...2,7
bar: (4,3...5,3)
3rd speed 1/min: 1100
Supply-pump pressure bar: 5,3...5,9
bar: (5,1...6,1)

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 15...30
quantity cm³/10s: -
2nd speed 1/min: 1250
Overflow : 20...50
quantity cm³/10s: -

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1340
Del.quantity cm³/: 25,5...31,5
1000H.: (16,5...28,5)
3rd speed 1/min: 1320
Del.quantity cm³/: 15,0...55,0
1000H.: -
4th speed 1/min: 1250
Del.quantity cm³/: 80,0...83,0
1000H.: 88,5...84,5
5th speed 1/min: 1100
Del.quantity cm³/: 85,0...86,0
1000H.: (82,5...88,5)
6th speed 1/min: 750
Del.quantity cm³/: 88,5...92,5
1000H.: 86,5...94,5
7th speed 1/min: 600
Del.quantity cm³/: 86,5...94,5
1000H.: (84,5...96,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 18,5...24,5
1000H.: (16,5...26,5)

2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 100,0

2nd speed 1/min: 200
Del.quantity cm³/: -
max. 1000H.: 85,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 1,3...1,7
SVS max. mm : 3,7
XK mm : 19,7...19,9
XL mm : 13,3...16,7

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P5
Edition : 26.03.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R123-1
Type number : 0 460 424 007
Customer Part-No. : 3 917 653

Customer-specific information
Customer : CDC

Engine : 4 BT 390

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 016

Opening
pressure bar : 207...210

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm : 2,0
mm : +0,02(0,06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

H23

Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,5...5,1

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm3/
1000H.: 85,7...86,7
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 18,5...24,5
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1220
Del.quantity cm3/
1000H.: 19,5...25,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 97,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1,1...1,9
mm: (0,8...2,2)
2nd speed 1/min: 900
TD travel mm: 2,3...2,7
mm: (1,8...3,2)
3rd speed 1/min: 1100
TD travel mm: 3,1...3,9
mm: (2,8...4,2)

Supply-pump pressure characteristic:

1st speed 1/min: 750
Supply-pump
pressure bar: 3,8...4,4
2nd speed 1/min: 900
Supply-pump
pressure bar: 4,5...5,1
3rd speed 1/min: 1100

Supply-pump

pressure bar: 5,3...5,9

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1270
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1200
Del.quantity cm³/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1220
Del.quantity cm³/: 19,5...25,5
1000H.: (16,5...28,5)
4th speed 1/min: 1100
Del.quantity cm³/: 80,5...83,5
1000H.: (79,0...85,0)
5th speed 1/min: 900
Del.quantity cm³/: 85,7...86,7
1000H.: (83,2...89,2)
6th speed 1/min: 750
Del.quantity cm³/: 85,8...89,8
1000H.: (83,8...91,8)
7th speed 1/min: 600
Del.quantity cm³/: 83,0...91,0
1000H.: (81,0...93,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 18,5...24,5
1000H.: (16,5...26,5)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 100,0

2nd speed 1/min: 200
Del.quantity cm³/: -
max. 1000H.: 85,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	1,4...1,6
SVS max.	mm	:	3,9
XK	mm	:	18,8...20,8
XL	mm	:	13,2...16,6

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P6
Edition : 26.3.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R123-10
Type number : 0 460 424 019
Customer Part-No. : 3 917 656

Customer-specific information
Customer : CDC

Engine : 4 BTA 3,9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 016

Opening
pressure bar : 204...210

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,7
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850

H25

Setting value mm: 3,7...4,1

Supply-pump pressure:

Speed 1/min: 850
Setting value bar: 5,9...6,5

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm3/
1000H.: 90,5...91,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 22,0...28,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340
Del.quantity cm3/
1000H.: 28,0...34,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 105,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,6...2,4
mm: (1,3...2,7)
2nd speed 1/min: 850
TD travel mm: 3,7...4,1
mm: (3,2...4,6)
3rd speed 1/min: 1100
TD travel mm: 4,6...5,4
mm: (4,3...5,7)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 4,3...4,9
2nd speed 1/min: 850
Supply-pump
pressure bar: 5,8...6,5
3rd speed 1/min: 1100

Supply-pump
pressure

bar: 6,7...7,3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1340
Del.quantity cm³/: 28,0...34,0
1000H.: (25,0...37,0)
3rd speed 1/min: 1290
Del.quantity cm³/: 68,0...76,0
1000H.: (66,0...78,0)
4th speed 1/min: 1250
Del.quantity cm³/: 84,5...87,5
1000H.: (83,0...89,0)
5th speed 1/min: 1100
Del.quantity cm³/: 90,5...91,5
1000H.: (88,0...94,0)
6th speed 1/min: 850
Del.quantity cm³/: 94,5...98,5
1000H.: (92,5...100,5)
7th speed 1/min: 500
Del.quantity cm³/: 82,0...90,0
1000H.: (80,0...92,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 22,0...28,0
1000H.: (20,0...30,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 105,0

2nd speed 1/min: 250
Del.quantity cm³/: -
max. 1000H : 105,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 0,6...1,0
XK mm : -
XL mm : -

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P9
Edition : 10.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R301-1
Type number : 0 460 424 045

Customer-specific information
Customer : CDC

Engine : 4 BT

Power k: 77
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,0
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2,5...2,9
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5,8...6,4
KSB solenoid-operated
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 74,5...75,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 49,5...50,5
KSB solenoid-operated
valve volt: 12,0

Low-idle speed regulation:

Speed 1/min: 400
Charge press. hPa: -
Del.quantity cm3/
1000H.: 9,0...13,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 56,0...62,0
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm3/1000H.: 80,0

KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400
Charge press. hPa: -
TD travel mm: 3,0...4,0
mm: -

KSB solenoid-operated
valve volt: -
2nd speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 0,6...1,4
mm: (0,3...1,7)

KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2,5...2,9
mm: (2,0...3,4)

KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)

KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 3,1...3,7

KSB solenoid-operated
valve volt: 12,0

2nd speed 1/min: 850
Charge press. hPa: 1000

Supply-pump
pressure bar: 4,8...5,4

KSB solenoid-operated
valve volt: 12,0

3rd speed 1/min: 1100
Charge press. hPa: 1000

Supply-pump
pressure bar: 5,8...6,4

KSB solenoid-operated
valve volt: 12,0

4th speed 1/min: 1250
Charge press. hPa: 1000

Supply-pump
pressure bar: 6,5...7,1

KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Overflow : 41...83

quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting
point hPa: 500
LDA stroke mm: 7,4
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 65,0...66,0
1000H.: (61,5...69,5)

2nd speed 1/min: 1500
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...3,0
1000H.: -

3rd speed 1/min: 1450
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...15,0
1000H.: -

4th speed 1/min: 1400
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 15,0...55,0
1000H.: -

5th speed 1/min: 1330
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 56,0...62,0
1000H.: (53,0...65,0)

6th speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 71,0...74,0
1000H.: (69,5...75,5)

7th speed 1/min: 1100
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0

Del.quantity cm³/: 72,5...75,5
1000H.: (70,5...77,5)
8th speed 1/min: 850
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 74,5...75,5
1000H.: (72,0...78,0)
9th speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 49,5...50,5
1000H.: (46,0...54,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: 12,0
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 9,0...13,0
1000H.: (6,0...16,0)
2nd speed 1/min: 500
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 220
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
ind. 1000H: 80,0

2nd speed 1/min: 320
Charge press. hPa: -
Del.quantity cm³/: -
max. 1000H : 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: -
MS	mm	: 1,4...1,8
SVS max.	mm	: 2,7
XK	mm	: -
XL	mm	: -

Remarks:

: C.D.C. # 391 1242

* Correction at adjusting nut (46)

Operate control lever after each
manifold-pressure compensator pressure
change.

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P11
Edition : 17.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R301-1
Type number : 0 460 424 045
Customer Part-No. : 3 911 243

Customer-specific information
Customer : CDC

Engine : 4 BT

Power k: 77
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,0
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2,5...2,9
KSB solenoid-operated
valve volt: 24,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5,8...6,4
KSB solenoid-operated
valve volt: 24,0

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 74,5...75,5
KSB solenoid-operated
valve volt : 24,0
Dispersion cm3/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 49,5...50,5
KSB solenoid-operated
valve volt: 24,0

Low-idle speed regulation:

Speed 1/min: 400
Charge press. hPa: -
Del.quantity cm3/
1000H.: 9,0...13,0
KSB solenoid-operated
valve volt: 24,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 56,0...62,0
KSB solenoid-operated
valve volt: 24,0

Start:

Speed 1/min: 100
Charge press. hPa: -

Del.quantity : -
mind cm3/1000H.: 80,0
KSB solenoid-operated
valve volt: 24,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400*
Charge press. hPa: -
TD travel mm: 3,0...4,0
mm: -
KSB solenoid-operated
valve volt: -
2nd speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
KSB solenoid-operated
valve volt: 24,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2,5...2,9
mm: (2,0...3,4)
KSB solenoid-operated
valve volt: 24,0
4th speed 1/min: 1250
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)
KSB solenoid-operated
valve volt: 24,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 3,1...3,7
KSB solenoid-operated
valve volt: 24,0
2nd speed 1/min: 850
Charge press. hPa: 1000
Supply-pump
pressure bar: 4,8...5,4
KSB solenoid-operated
valve volt: 24,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump
pressure bar: 5,8...6,4
KSB solenoid-operated
valve volt: 24,0
4th speed 1/min: 1250
Charge press. hPa: 1000
Supply-pump
pressure bar: 6,5...7,1

KSB solenoid-operated
valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 24,0
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting
point hPa: 500
LDA stroke mm: 7,4
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 65,0...66,0
1000H.: (61,5...69,5)
2nd speed 1/min: 1500
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1450
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 0,0...15,0
1000H.: -
4th speed 1/min: 1400
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 15,0...55,0
1000H.: -
5th speed 1/min: 1330
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 56,0...62,0
1000H.: (53,0...65,0)
6th speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 71,0...74,0
1000H.: (69,5...75,5)
7th speed 1/min: 1100
Charge press. hPa: 1000

KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 72,5...75,5
 1000H.: (70,5...77,5)
 8th speed 1/min: 850
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 74,5...75,5
 1000H.: (72,0...78,0)
 9th speed 1/min: 500
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 49,5...50,5
 1000H.: (46,0...54,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
 Del.quantity cm³/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 400
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 9,0...13,0
 1000H.: (6,0...16,0)
 2nd speed 1/min: 500
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 220
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: -
 ind. 1000H: 80,0

2nd speed 1/min: 320
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: -
 max. 1000H : 80,0

Shutoff electromagnet:

Cut-in
 min. voltage : 20,0
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
 K mm : -
 KF mm : -
 MS mm : 1,4...1,8
 SVS max. mm : 2,7
 XK mm : -
 XL mm : -

Remarks:

Operate control lever after each
 manifold-pressure compensator pressure
 change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for
 DI-engines: only test using timing-
 device-travel measuring device with
 metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P13
Edition : 17.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R301-1
Type number : 0 460 424 045
Customer Part-No. : 3 914 884

Customer-specific information
Customer : CDC

Engine : 4 BT

Power k: 77
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 1,0
mm: $\pm 0,02(0,06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2,5...2,9
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5,8...6,4
KSB solenoid-operated
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 74,5...75,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 49,5...50,5
KSB solenoid-operated
valve volt: 12,0

Low-idle speed regulation:

Speed 1/min: 400
Charge press. hPa: -
Del.quantity cm³/
1000H.: 9,0...13,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 56,0...62,0
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Charge press. hPa: -

Del.quantity : -
mind cm3/1000H.: 80,0
KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400*
Charge press. hPa: -
TD travel mm: 3,0...4,0
mm: -
KSB solenoid-operated
valve volt: -
2nd speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2,5...2,9
mm: (2,0...3,4)
KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 3,1...3,7
KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 850
Charge press. hPa: 1000
Supply-pump
pressure bar: 4,8...5,4
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump
pressure bar: 5,8...6,4
KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1000
Supply-pump
pressure bar: 6,5...7,1

KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting
point hPa: 500
LDA stroke mm: 7,4
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 65,0...66,0
1000H.: (61,5...69,5)
2nd speed 1/min: 1500
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1450
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 0,0...15,0
1000H.: -
4th speed 1/min: 1400
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 15,0...55,0
1000H.: -
5th speed 1/min: 1330
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 56,0...62,0
1000H.: (53,0...65,0)
6th speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 71,0...74,0
1000H.: (69,5...75,5)
7th speed 1/min: 1100
Charge press. hPa: 1000

KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 72,5...75,5
 1000H.: (70,5...77,5)
 8th speed 1/min: 850
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 74,5...75,5
 1000H.: (72,0...78,0)
 9th speed 1/min: 500
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 49,5...50,5
 1000H.: (46,0...54,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
 Del.quantity cm³/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 400
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 9,0...13,0
 1000H.: (6,0...16,0)
 2nd speed 1/min: 500
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 220
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: -
 ind. 1000H.: 80,0

2nd speed 1/min: 320
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: -
 max. 1000H.: 80,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: -
MS	mm	: 1,4...1,8
SVS max.	mm	: 2,7
XK	mm	: -
XL	mm	: -

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P10
Edition : 17.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R301-1
Type number : 0 460 424 045
Customer Part-No. : 3 914 885

Customer-specific information
Customer : CDC

Engine : 4 BT

Power k: 77
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 1,0
mm: $\pm 0,02(0,06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2,5...2,9
KSB solenoid-operated
valve volt: 24,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5,8...6,4
KSB solenoid-operated
valve volt: 24,0

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 74,5...75,5
KSB solenoid-operated
valve volt : 24,0
Dispersion cm³ / : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 49,5...50,5
KSB solenoid-operated
valve volt: 24,0

Low-idle speed regulation:

Speed 1/min: 400
Charge press. hPa: -
Del.quantity cm³/
1000H.: 9,0...13,0
KSB solenoid-operated
valve volt: 24,0
Dispersion cm³ / : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 56,0...62,0
KSB solenoid-operated
valve volt: 24,0

Start:

Speed 1/min: 100
Charge press. hPa: -

Del.quantity : -
mind cm3/1000H.: 80,0
KSB solenoid-operated
valve volt: 24,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400*
Charge press. hPa: -
TD travel mm: 3,0...4,0
mm: -
KSB solenoid-operated
valve volt: -
2nd speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
KSB solenoid-operated
valve volt: 24,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2,5...2,9
mm: (2,0...3,4)
KSB solenoid-operated
valve volt: 24,0
4th speed 1/min: 1250
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)
KSB solenoid-operated
valve volt: 24,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 3,1...3,7
KSB solenoid-operated
valve volt: 24,0
2nd speed 1/min: 850
Charge press. hPa: 1000
Supply-pump
pressure bar: 4,8...5,4
KSB solenoid-operated
valve volt: 24,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump
pressure bar: 5,8...6,4
KSB solenoid-operated
valve volt: 24,0
4th speed 1/min: 1250
Charge press. hPa: 1000
Supply-pump
pressure bar: 6,5...7,1

KSB solenoid-operated
valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 24,0
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting
point hPa: 500
LDA stroke mm: 7,4
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 65,0...66,0
1000H.: (61,5...69,5)
2nd speed 1/min: 1500
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1450
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 0,0...15,0
1000H.: -
4th speed 1/min: 1400
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 15,0...55,0
1000H.: -
5th speed 1/min: 1330
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 56,0...62,0
1000H.: (53,0...65,0)
6th speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm3/: 71,0...74,0
1000H.: (69,5...75,5)
7th speed 1/min: 1100
Charge press. hPa: 1000

KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 72,5...75,5
 1000H.: (70,5...77,5)
 8th speed 1/min: 850
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 74,5...75,5
 1000H.: (72,0...78,0)
 9th speed 1/min: 500
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 49,5...50,5
 1000H.: (46,0...54,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
 Del.quantity cm³/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 400
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 9,0...13,0
 1000H.: (6,0...16,0)
 2nd speed 1/min: 500
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 220
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: -
 ind. 1000H.: 80,0

2nd speed 1/min: 320
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: -
 max. 1000H.: 80,0

Shutoff electromagnet:

Cut-in
 min. voltage : 20,0
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: -
MS	mm	: 1,4...1,8
SVS max.	mm	: 2,7
XK	mm	: -
XL	mm	: -

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P14
Edition : 17.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R301-1
Type number : 0 460 424 045
Customer Part-No. : 3 915 288

Customer-specific information
Customer : CDC

Engine : 4 BT

Power k: 77
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,0
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2,5...2,9
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5,8...6,4
KSB solenoid-operated
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 74,5...75,5
KSB solenoid-operated
valve volt : 12,0
Dispersion cm3/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 49,5...50,5
KSB solenoid-operated
valve volt: 12,0

Low-idle speed regulation:

Speed 1/min: 400
Charge press. hPa: -
Del.quantity cm3/
1000H.: 9,0...13,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 56,0...62,0
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Charge press. hPa: -

Del.quantity : -
mind cm3/1000H.: 80,0
KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400*
Charge press. hPa: -
TD travel mm: 3,0...4,0
mm: -
KSB solenoid-operated
valve volt: -
2nd speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2,5...2,9
mm: (2,0...3,4)
KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 3,1...3,7
KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 850
Charge press. hPa: 1000
Supply-pump
pressure bar: 4,8...5,4
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump
pressure bar: 5,8...6,4
KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1000
Supply-pump
pressure bar: 6,5...7,1

KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting
point hPa: 500
LDA stroke mm: 7,4
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 65,0...66,0
1000H.: (61,5...69,5)
2nd speed 1/min: 1500
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1450
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 0,0...15,0
1000H.: -
4th speed 1/min: 1400
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 15,0...55,0
1000H.: -
5th speed 1/min: 1330
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 56,0...62,0
1000H.: (53,0...65,0)
6th speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 71,0...74,0
1000H.: (69,5...75,5)
7th speed 1/min: 1100
Charge press. hPa: 1000

KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 72,5...75,5
 1000H.: (70,5...77,5)
 8th speed 1/min: 850
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 74,5...75,5
 1000H.: (72,0...78,0)
 9th speed 1/min: 500
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 49,5...50,5
 1000H.: (46,0...54,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
 Del.quantity cm³/: 0...3
 1000H.: -

Electr. shutoff:

Speed 1/min: 400
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 9,0...13,0
 1000H.: (6,0...16,0)
 2nd speed 1/min: 500
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 220
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: -
 ind. 1000H.: 80,0

2nd speed 1/min: 320
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: -
 max. 1000H.: 80,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: -
MS	mm	: 1,4...1,8
SVS max.	mm	: 2,7
XK	mm	: -
XL	mm	: -

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P11
Edition : 17.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R301-1
Type number : 0 460 424 045
Customer Part-No. : 3 915 428

Customer-specific information
Customer : CDC

Engine : 4 BT

Power k: 77
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 1,0
mm: $\pm 0,02(0,06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2,5...2,9
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5,8...6,4
KSB solenoid-operated
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 74,5...75,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³ : 4,0
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 49,5...50,5
KSB solenoid-operated
valve volt: 12,0

Low-idle speed regulation:

Speed 1/min: 400
Charge press. hPa: -
Del.quantity cm³/
1000H.: 9,0...13,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 56,0...62,0
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Charge press. hPa: -

Del.quantity : -
mind cm3/1000H.: 80,0
KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400*
Charge press. hPa: -
TD travel mm: 3,0...4,0
mm: -
KSB solenoid-operated
valve volt: -
2nd speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2,5...2,9
mm: (2,0...3,4)
KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 3,1...3,7
KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 850
Charge press. hPa: 1000
Supply-pump
pressure bar: 4,8...5,4
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump
pressure bar: 5,8...6,4
KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1000
Supply-pump
pressure bar: 6,5...7,1

KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting
point hPa: 500
LDA stroke mm: 7,4
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 65,0...66,0
1000H.: (61,5...69,5)
2nd speed 1/min: 1500
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1450
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 0,0...15,0
1000H.: -
4th speed 1/min: 1400
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 15,0...55,0
1000H.: -
5th speed 1/min: 1330
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 56,0...62,0
1000H.: (53,0...65,0)
6th speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm3/: 71,0...74,0
1000H.: (69,5...75,5)
7th speed 1/min: 1100
Charge press. hPa: 1000

KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 72,5...75,5
 1000H.: (70,5...77,5)
 8th speed 1/min: 850
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 74,5...75,5
 1000H.: (72,0...78,0)
 9th speed 1/min: 500
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 49,5...50,5
 1000H.: (46,0...54,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
 Del.quantity cm³/: 0...3
 1000H.: -

Electr. shutoff:

Speed 1/min: 400
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 9,0...13,0
 1000H.: (6,0...16,0)
 2nd speed 1/min: 500
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 220
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: -
 ind. 1000H.: 80,0

2nd speed 1/min: 320
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm³/: -
 max. 1000H.: 80,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: -
MS	mm	: 1,4...1,8
SVS max.	mm	: 2,7
XK	mm	: -
XL	mm	: -

Remarks:

Operate control lever after each
 manifold-pressure compensator pressure
 change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for
 DI-engines: only test using timing-
 device-travel measuring device with
 metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P16
Edition : 23.04.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/12F1250 R359-1
Type number : 0 460 424 055

Customer-specific information
Customer : CDC

Engine : 4 BT

Power k: 77
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm: 1,0
mm: $\pm 0,02(0,06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 1,9...2,3
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5,4...6,0
KSB solenoid-operated
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 73,0...74,0
KSB solenoid-operated
valve volt : 12,0
Dispersion cm3/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 43,5...44,5
KSB solenoid-operated
valve volt: 12,0

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm3/
1000H.: 7,5...11,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 54,0...60,0
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 90,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400
 Charge press. hPa: -
 TD travel mm: 2,7...3,7
 mm: -
 KSB solenoid-operated
 valve volt: -
 2nd speed 1/min: 900
 Charge press. hPa: 1000
 TD travel mm: 0,7...1,5
 mm: (0,4...1,8)
 KSB solenoid-operated
 valve volt: 12,0
 3rd speed 1/min: 1100
 Charge press. hPa: 1000
 TD travel mm: 1,9...2,3
 mm: (1,4...2,8)
 KSB solenoid-operated
 valve volt: 12,0
 4th speed 1/min: 1250
 Charge press. hPa: 1000
 TD travel mm: 2,9...3,7
 mm: (2,6...4,0)
 KSB solenoid-operated
 valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump
 pressure bar: 2,7...3,3
 KSB solenoid-operated
 valve volt: 12,0
 2nd speed 1/min: 900
 Charge press. hPa: 1000
 Supply-pump
 pressure bar: 4,4...5,0
 KSB solenoid-operated
 valve volt: 12,0
 3rd speed 1/min: 1100
 Charge press. hPa: 1000
 Supply-pump
 pressure bar: 5,4...6,0
 KSB solenoid-operated
 valve volt: 12,0
 4th speed 1/min: 1250
 Charge press. hPa: 1000
 Supply-pump
 pressure bar: 6,0...6,6
 KSB solenoid-operated
 valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Overflow : 41...83
 quantity cm3/10s: (26...98)
 2nd speed 1/min: 1250
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 12,0
 Overflow : 55...138
 quantity cm3/10s: 40...153

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
 Charge-air pressure-setting
 point hPa: 550
 LDA stroke mm: 6,4
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 64,5...65,5
 1000H.: (61,0...69,0)
 2nd speed 1/min: 1500
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 0,0...3,0
 1000H.: -
 3rd speed 1/min: 1460
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 0,0...15,0
 1000H.: -
 4th speed 1/min: 1400
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 15,0...55,0
 1000H.: -
 5th speed 1/min: 1340
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 54,0...60,0
 1000H.: (51,0...63,0)
 6th speed 1/min: 1250
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 68,5...71,5
 1000H.: (67,0...73,0)
 7th speed 1/min: 850
 Charge press. hPa: 1000
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 73,0...74,0
 1000H.: (70,5...76,5)
 8th speed 1/min: 700

Charge press. hPa: 550
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 64,5...65,5
1000H: (61,0...69,0)
9th speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 43,5...44,5
1000H: (40,0...48,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 7,5...11,5
1000H.: (4,5...14,5)
2nd speed 1/min: 400
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...6,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
ind. 1000H: 80,0

2nd speed 1/min: 280
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
max. 1000H : 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,7
KF	mm	: K-OT
MS	mm	: 1,3...1,7
SVS max.	mm	: 2,7
XK	mm	: 21,8...23,8
XL	mm	: 11,7...15,1

Remarks:

: C.D.C. # 391 7530
: C.D.C. # 391 1242

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P17
Edition : 23.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R359-1
Type number : 0 460 424 055
Customer Part-No. : 3 917 531

Customer-specific information
Customer : CDC

Engine : 4 BT

Power k: 77
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm: 1,0
mm: $\pm 0,02(0,06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 1,9...2,3
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5,4...6,0
KSB solenoid-operated
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 73,0...74,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 43,5...44,5
KSB solenoid-operated
valve volt: 12,0

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm³/
1000H.: 7,5...11,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 54,0...60,0
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 90,0

KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400
Charge press. hPa: -
TD travel mm: 2,7...3,7
mm: -

KSB solenoid-operated
valve volt: -
2nd speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 0,7...1,5
mm: (0,4...1,8)

KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 1,9...2,3
mm: (1,4...2,8)

KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)

KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 2,7...3,3

KSB solenoid-operated
valve volt: 12,0

2nd speed 1/min: 900
Charge press. hPa: 1000

Supply-pump
pressure bar: 4,4...5,0

KSB solenoid-operated
valve volt: 12,0

3rd speed 1/min: 1100
Charge press. hPa: 1000

Supply-pump
pressure bar: 5,4...6,0

KSB solenoid-operated
valve volt: 12,0

4th speed 1/min: 1250
Charge press. hPa: 1000

Supply-pump
pressure bar: 6,0...6,6

KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Overflow : 41...83

quantity cm³/10s: (26...98)

2nd speed 1/min: 1250
Charge press. hPa: 1000

KSB solenoid-operated
valve volt: 12,0

Overflow : 55...138
quantity cm³/10s: 40...153

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting
point hPa: 550

LDA stroke mm: 6,4

KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 64,5...65,5
1000H.: (61,0...69,0)

2nd speed 1/min: 1500
Charge press. hPa: 1000

KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...3,0
1000H.: -

3rd speed 1/min: 1460
Charge press. hPa: 1000

KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...15,0
1000H.: -

4th speed 1/min: 1400
Charge press. hPa: 1000

KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 15,0...55,0
1000H.: -

5th speed 1/min: 1340
Charge press. hPa: 1000

KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 54,0...60,0
1000H.: (51,0...63,0)

6th speed 1/min: 1250
Charge press. hPa: 1000

KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 68,5...71,5
1000H.: (67,0...73,0)

7th speed 1/min: 850
Charge press. hPa: 1000

KSB solenoid-operated
valve volt: 12,0

Del.quantity cm³/: 73,0...74,0
1000H.: (70,5...76,5)
8th speed 1/min: 700
Charge press. hPa: 550
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 64,5...65,5
1000H.: (61,0...69,0)
9th speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 43,5...44,5
1000H.: (40,0...48,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 7,5...11,5
1000H.: (4,5...14,5)
2nd speed 1/min: 400
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...6,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
ind. 1000H: 80,0

2nd speed 1/min: 280
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
max. 1000H : 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : 3,7
KF mm : K-OT
MS mm : 1,3...1,7
SVS max. mm : 2,7
XK mm : 21,8...23,8
XL mm : 11,7...15,1

Remarks:

:
Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P18
Edition : 23.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R359-1
Type number : 0 460 424 055
Customer Part-No. : 3 917 532

Customer-specific information
Customer : CDC

Engine : 4 BT

Power k: 77
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C.
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm: 1,0
mm: $\pm 0,02(0,06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 1,9...2,3
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5,4...6,0
KSB solenoid-operated
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 73,0...74,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 43,5...44,5
KSB solenoid-operated
valve volt: 12,0

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm3/
1000H.: 7,5...11,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 54,0...60,0
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 90,0

KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400
Charge press. hPa: -
TD travel mm: 2,7...3,7
mm: -
KSB solenoid-operated
valve volt: -
2nd speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 0,7...1,5
mm: (0,4...1,8)
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 1,9...2,3
mm: (1,4...2,8)
KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 2,7...3,3
KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 900
Charge press. hPa: 1000
Supply-pump
pressure bar: 4,4...5,0
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump
pressure bar: 5,4...6,0
KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1000
Supply-pump
pressure bar: 6,0...6,6
KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Overflow : 55...138
quantity cm³/10s: 40...153

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting
point hPa: 550
LDA stroke mm: 6,4
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 64,5...65,5
1000H.: (61,0...69,0)
2nd speed 1/min: 1500
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1460
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...15,0
1000H.: -
4th speed 1/min: 1400
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 15,0...55,0
1000H.: -
5th speed 1/min: 1340
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 54,0...60,0
1000H.: (51,0...63,0)
6th speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 68,5...71,5
1000H.: (67,0...73,0)
7th speed 1/min: 850
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 12,0

Del.quantity cm³/: 73,0...74,0
1000H.: (70,5...76,5)
8th speed 1/min: 700
Charge press. hPa: 550
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 64,5...65,5
1000H.: (61,0...69,0)
9th speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 43,5...44,5
1000H.: (40,0...48,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 7,5...11,5
1000H.: (4,5...14,5)
2nd speed 1/min: 400
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...6,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
ind. 1000H: 80,0

2nd speed 1/min: 280
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
max. 1000H : 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,7
KF mm : K-OT
MS mm : 1,3...1,7
SVS max. mm : 2,7
XK mm : 21,8...23,8
XL mm : 11,7...15,1

Remarks:

:
Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P19
Edition : 23.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R359-1
Type number : 0 460 424 055
Customer Part-No. : 3 917 533

Customer-specific information
Customer : CDC

Engine : 4 BT

Power k: 77
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm: 1,0
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 1,9...2,3
KSB solenoid-operated
valve volt: 24,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5,4...6,0
KSB solenoid-operated
valve volt: 24,0

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 73,0...74,0
KSB solenoid-operated
valve volt: 24,0
Dispersion cm3/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 43,5...44,5
KSB solenoid-operated
valve volt: 24,0

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm3/
1000H.: 7,5...11,5
KSB solenoid-operated
valve volt: 24,0
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 54,0...60,0
KSB solenoid-operated
valve volt: 24,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 90,0

KSB solenoid-operated
valve volt: 24,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400
Charge press. hPa: -
TD travel mm: 2,7...3,7
mm: -

KSB solenoid-operated
valve volt: -
2nd speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 0,7...1,5
mm: (0,4...1,8)

KSB solenoid-operated
valve volt: 24,0
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 1,9...2,3
mm: (1,4...2,8)

KSB solenoid-operated
valve volt: 24,0
4th speed 1/min: 1250
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)

KSB solenoid-operated
valve volt: 24,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
pressure bar: 2,7...3,3

KSB solenoid-operated
valve volt: 24,0
2nd speed 1/min: 900
Charge press. hPa: 1000

Supply-pump
pressure bar: 4,4...5,0

KSB solenoid-operated
valve volt: 24,0
3rd speed 1/min: 1100
Charge press. hPa: 1000

Supply-pump
pressure bar: 5,4...6,0

KSB solenoid-operated
valve volt: 24,0
4th speed 1/min: 1250
Charge press. hPa: 1000

Supply-pump
pressure bar: 6,0...6,6

KSB solenoid-operated
valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 24,0
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Overflow : 55...138
quantity cm³/10s: 40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting
point hPa: 550
LDA stroke mm: 6,4
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 64,5...65,5
1000H.: (61,0...69,0)

2nd speed 1/min: 1500
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 0,0...3,0
1000H.: -

3rd speed 1/min: 1460
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 0,0...15,0
1000H.: -

4th speed 1/min: 1400
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 15,0...55,0
1000H.: -

5th speed 1/min: 1340
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 54,0...60,0
1000H.: (51,0...63,0)

6th speed 1/min: 1250
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 68,5...71,5
1000H.: (67,0...73,0)

7th speed 1/min: 850
Charge press. hPa: 1000
KSB solenoid-operated
valve volt: 24,0

Del.quantity cm³/: 73,0...74,0
 1000H.: (70,5...76,5)
 8th speed 1/min: 700
 Charge press. hPa: 550
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 64,5...65,5
 1000H.: (61,0...69,0)
 9th speed 1/min: 500
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 43,5...44,5
 1000H.: (40,0...48,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
 Del.quantity cm³/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 350
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 7,5...11,5
 1000H.: (4,5...14,5)
 2nd speed 1/min: 400
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: 0,0...6,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: -
 ind. 1000H: 80,0

2nd speed 1/min: 280
 KSB solenoid-operated
 valve volt: 24,0
 Del.quantity cm³/: -
 max. 1000H: 80,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
 K mm : 3,7
 KF mm : K-OT
 MS mm : 1,3...1,7
 SVS max. mm : 2,7
 XK mm : 21,8...23,8
 XL mm : 11,7...15,1

Remarks:

:
 Operate control lever after each
 manifold-pressure compensator pressure
 change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for
 DI-engines: only test using timing-
 device-travel measuring device with
 metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P2
Edition : 27.3.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R378-4
Customer Part-No. : 3 917 033

Customer-specific information
Customer : CDC

Engine : 4 BT 3.9 IND.

Power k: 59
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 1,8
mm: $\pm 0,02(0,06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,1...4,7

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm3/
1000H.: 58,5...59,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: 7,0

Full-load speed regulation:

Speed 1/min: 1140
Del.quantity cm3/
1000H: 45,0...51,0

Start:

Speed 1/min: 110
Del.quantity : -
mind cm3/1000H.: 50,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1,3...2,1
mm: 1,0...2,4
2nd speed 1/min: 900
TD travel mm: 2,3...2,7
mm: 1,8...2,2
3rd speed 1/min: 1100
TD travel mm: 3,1...3,9
mm: 2,8...4,2

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,3...2,9
bar: 2,1...3,1
2nd speed 1/min: 900

Supply-pump
pressure bar: 4,1...4,7
bar: 3,9...4,9
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4,9...5,5
bar: 4,7...5,7

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 15...30
quantity cm³/10s: -
2nd speed 1/min: 1100
Overflow : 20...50
quantity cm³/10s: -

Delivery-quant. and breakaway char.:

1st speed 1/min: 1210
Del.quantity cm³/: 0,00...15,0
1000H.: -
2nd speed 1/min: 1170
Del.quantity cm³/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1140
Del.quantity cm³/: 45,0...51,0
1000H.: 42,0...54,0
4th speed 1/min: 1100
Del.quantity cm³/: 58,0...61,0
1000H.: 56,5...62,5
5th speed 1/min: 900
Del.quantity cm³/: 58,5...59,5
1000H.: 56,0...62,0
6th speed 1/min: 750
Del.quantity cm³/: 57,5...61,5
1000H.: 55,5...63,5
7th speed 1/min: 500
Del.quantity cm³/: 50,0...58,0
1000H.: 48,0...60,0

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...14,0
1000H.: (6,0...16,0)

2nd speed 1/min: 500
Del.quantity cm³/: 0,0...4,0
1000H.: (-)

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 80,0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 80,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,0...5,4
MS	mm	: 1,1...1,5
SVS max.	mm	: 3,5
XK	mm	: -
XL	mm	: -

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P4
Edition : 28.3.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1150 R374-1
Type number : 0 460 424 063

Customer-specific information
Customer : CDC

Engine : 4 BTA 3,9 IND

Power k: 112
Speed 1/mi: 2300

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,55
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 8,1...9,1
Dispersion cm3/ : 4,0
1000H : 4,5

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 59,0...69,0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: 7,0

Full-load speed regulation:

Speed 1/min: 1220
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 62,5...68,5

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm3/1000H.: 100,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
TD travel mm: 1,8...2,6
mm: (1,5...2,9)
2nd speed 1/min: 850

Charge press. hPa: 1000
 TD travel mm: 4,0...4,4
 mm: (3,5...4,9)
 3rd speed 1/min: 1150
 Charge press. hPa: 1000
 TD travel mm: 5,2...6,0
 mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 4,0...4,6
 bar: (3,8...4,8)
 2nd speed 1/min: 850
 Charge press. hPa: 1000
 Supply-pump pressure bar: 5,6...6,2
 bar: (5,4...6,4)
 3rd speed 1/min: 1150
 Charge press. hPa: 1000
 Supply-pump pressure bar: 6,9...7,5
 bar: (6,7...7,7)

Overflow quantity at overflow valve:

1st speed 1/min: 5000
 Charge press. hPa: -
 Overflow : 15...30
 quantity cm³/10s: -
 2nd speed 1/min: 1150
 Charge press. hPa: 1000
 Overflow : 20...50
 quantity cm³/10s: -

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
 Charge-air pressure-setting point hPa: 350
 Del.quantity cm³/: 79,5...80,5
 1000H.: (76,0...84,0)
 2nd speed 1/min: 1320
 Charge press. hPa: 1000
 Del.quantity cm³/: 0,0...3,0
 1000H.: -
 3rd speed 1/min: 1260
 Charge press. hPa: 1000
 Del.quantity cm³/: 15,0...55,0
 1000H.: -
 4th speed 1/min: 1220
 Charge press. hPa: 1000
 Del.quantity cm³/: 62,5...68,5
 1000H.: (59,5...71,5)
 5th speed 1/min: 1150
 Charge press. hPa: 1000
 Del.quantity cm³/: 76,0...79,0
 1000H.: (74,5...80,5)

6th speed 1/min: 1000
 Charge press. hPa: 1000
 Del.quantity cm³/: 79,5...82,5
 1000H.: (77,5...84,5)
 7th speed 1/min: 850
 Charge press. hPa: 1000
 Del.quantity cm³/: 85,5...86,5
 1000H.: (83,0...89,0)
 8th speed 1/min: 500
 Charge press. hPa: -
 Del.quantity cm³/: 63,5...64,5
 1000H.: (60,0...68,0)
 9th speed 1/min: 500
 Charge press. hPa: 1000
 Del.quantity cm³/: 90,0...98,0
 1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150
 Del.quantity cm³/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 375
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
 Del.quantity cm³/: 8,0...14,0
 1000H.: (6,0...16,0)
 2nd speed 1/min: 450
 Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
 Del.quantity cm³/: -
 ind. 1000H: 60,0
 2nd speed 1/min: 230
 Del.quantity cm³/: -
 max. 1000H : 60,0

Shutoff electromagnet:

Cut-in
 min. voltage : 20,0
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
 K mm : -

KF	mm	: 5,0...5,4
MS	mm	: 1,0...1,4
SVS max.	mm	: 2,6
XK	mm	: -
XL	mm	: -

Remarks:

: C.D.C. # 391 7519

* Correction at adjusting nut (46)

Operate control lever after each manifold-pressure compensator pressure change.

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 P3
Edition : 27.3.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R374-2
Type number : 0 460 424 073

Customer-specific information
Customer : CDC

Engine : 4 BTA 3,9 IND

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,55
mm: +0,02(0,06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000

Setting value mm: 4,9...5,7

Supply-pump pressure:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 100,5...101,5
Dispersion cm3/ : 4,0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 86,0...87,0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 7,0...13,0
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1150
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 73,0...79,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 80,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
TD travel mm: 1,8...2,6
mm: (1,5...2,9)

2nd speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 4,0...4,4
mm: (3,5...4,9)

3rd speed 1/min: 1100

Charge press. hPa: 1000
TD travel mm: 4,9...5,7
mm: (4,6...6,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 4,0...4,6
bar: (3,8...4,9)
2nd speed 1/min: 850
Charge press. hPa: 1000
Supply-pump pressure bar: 5,6...6,2
bar: (5,4...6,4)
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 6,7...7,3
bar: (6,5...7,5)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow quantity cm³/10s: 15...30
2nd speed 1/min: 1100
Charge press. hPa: 1000
Overflow quantity cm³/10s: 20...50

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 350
Del.quantity cm³/: 96,5...97,5
1000H.: (96,6...97,4)
2nd speed 1/min: 1300
KSB solenoid-operated valve volt: 1000
Del.quantity cm³/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1230
Charge press. hPa: 1000
Del.quantity cm³/: 15,0...55,0
1000H.: -
4th speed 1/min: 1150
Charge press. hPa: 1000
Del.quantity cm³/: 73,0...79,0
1000H.: (70,0...82,0)
5th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 90,5...93,5
1000H.: (89,0...95,0)
6th speed 1/min: 900
Charge press. hPa: 1000

Del.quantity cm³/: 97,5...100,5
1000H.: (95,5...102,5)
7th speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/: 100,5...101,5
1000H.: (98,0...104,0)
8th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 86,0...87,0
1000H.: (82,5...90,5)
9th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 110,5...120,5
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 7,0...13,0
1000H.: (5,0...15,0)
2nd speed 1/min: 420
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 80,0
2nd speed 1/min: 230
Del.quantity cm³/: -
max. 1000H : 100,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,0...5,4
MS	mm	: 1,0...1,4
SVS max.	mm	: 2,3
XK	mm	: 21,8...23,8
XL	mm	: 13,2...16,6

Remarks:

* Correction at adjusting nut (46)

Operate control lever after each manifold-pressure compensator pressure change.

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S2
Edition : 28.3.90
replaces : 11.12.86
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1200 R225-6
Type number : 0 460 426 073

Customer-specific information
Customer : CDC

Engine : 6 BT-5,9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02

Start of delivery block
Piston stroke mm : 1,5
mm : +0,02(0,06)
Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm³/
1000H.: 61,5...62,5

Low-idle speed regulation:

Speed 1/min: 340
Del.quantity cm³/
1000H.: 8,0...14,0
Dispersion cm³/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1265
Del.quantity cm³/
1000H.: 42,5...48,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 50,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,6)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,4...3,0
bar: (2,2...3,2)
2nd speed 1/min: 750
Supply-pump
pressure bar: 3,5...4,1
bar: (3,3...4,3)
3rd speed 1/min: 1100

Supply-pump
pressure

bar: 4,8...5,4
bar: (4,6...5,6)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 15...30
quantity cm³/10s: -
2nd speed 1/min: 1200
Overflow : 20...50
quantity cm³/10s: -

Delivery-quant. and breakaway char.:

1st speed 1/min: 1350
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1330
Del.quantity cm³/: 0,0...15,0
1000H.: -
3rd speed 1/min: 1280
Del.quantity cm³/: 15,0...55,0
1000H.: -
4th speed 1/min: 1265
Del.quantity cm³/: 42,5...48,5
1000H.: (39,5...51,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1200
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 340
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 340
Del.quantity cm³/: 8,0...14,0
1000H.: (6,0...16,0)
2nd speed 1/min: 500
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 60,0
2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,0...5,4
MS	mm	: 1,2...1,6
SVS max.	mm	: 1,6
XK	mm	: 18,8...20,8
XL	mm	: 12,0...15,4

Remarks:

: C.D.C. # 390 8216

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L10
Edition : 28.3.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R173-7
Type number : 0 460 426 089

Customer-specific information
Customer : CDC

Engine : 6 BTA-5,9 IND.

Power k: 141
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,85
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Charge press. hPa: 1000
Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 900
Charge press. hPa: 1000
Setting value bar: 4,3...4,9

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 64,0...74,0
Dispersion cm3/ : 4,0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 39,0...40,0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 8,0...14,0

Full-load speed regulation:

Speed 1/min: 1140
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 46,0...52,0

Start:

Speed 1/min: 140
Del.quantity : -
mind cm3/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700
Charge press. hPa: 1000
TD travel mm: 0,8...1,6
mm: -
2nd speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 2,0...2,4
mm: -

3rd speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 2,4...3,2
mm: -

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 2,6...3,2
bar: -
2nd speed 1/min: 900
Charge press. hPa: 1000
Supply-pump pressure bar: 4,3...4,9
bar: -
3rd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump pressure bar: 4,9...5,5
bar: -

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow quantity cm³/10s: 15...30
2nd speed 1/min: 1050
Charge press. hPa: 1000
Overflow quantity cm³/10s: 20...50

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 400
Del.quantity cm³/1000H.: 57,0...67,0
2nd speed 1/min: 1250
Charge press. hPa: 1000
Del.quantity cm³/1000H.: 0,0...3,0
3rd speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm³/1000H.: 0,0...15,0
4th speed 1/min: 1160
Charge press. hPa: 1000
Del.quantity cm³/1000H.: 0,0...15,0
5th speed 1/min: 1140
Charge press. hPa: 1000
Del.quantity cm³/1000H.: 46,0...52,0
6th speed 1/min: 1050
Charge press. hPa: 1000

Del.quantity cm³/1000H.: 64,5...67,5
7th speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm³/1000H.: 65,5...68,5
8th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/1000H.: 68,5...69,5
9th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/1000H.: 65,0...73,0
10th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/1000H.: 39,0...40,0

Zero delivery (stop):

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/1000H.: 8,0...14,0
2nd speed 1/min: 500
Del.quantity cm³/1000H.: 0,0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 100
Del.quantity cm³/ind. 1000H.: 60,0
2nd speed 1/min: 140
Del.quantity cm³/max. 1000H.: 60,0
3rd speed 1/min: 240
Del.quantity cm³/1000H.: 60,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	1,2...1,6
SVS max.	mm	:	2,4
XK	mm	:	20,2...22,2
XL	mm	:	11,2...14,6

Remarks:

: C.D.C. # 390 4731
* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

Operate control lever after each
manifold-pressure compensator pressure
change.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W30
Edition : 17.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R195-1
Type number : 0 460 426 091

Customer-specific information
Customer : CDC

Engine : 590A

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm : 2,05
mm: $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Charge press. hPa: 1000

K14

Setting value mm: 1,8...2,2

Supply-pump pressure:

Speed 1/min: 900
Charge press. hPa: 1000
Setting value bar: 5,0...5,6

Full-load del. with charge press.:

Speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 78,5...79,5
Dispersion cm³ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 64,5...65,5

Low-idle speed regulation:

Speed 1/min: 365
Charge press. hPa: -
Del.quantity cm³/
1000H.: 9,5...13,5
Dispersion cm³ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1360
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 58,5...64,5

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 0,5...1,3
mm: (0,2...1,6)

2nd speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 1,8...2,2
mm: (1,3...2,7)

3rd speed 1/min: 1100
 Charge press. hPa: 1000
 TD travel mm: 2,7...3,5
 mm: (2,4...3,8)
 4th speed 1/min: 1250
 Charge press. hPa: 1000
 TD travel mm: 2,8...3,6
 mm: (2,5...3,9)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 3,2...3,8
 2nd speed 1/min: 900
 Charge press. hPa: 1000
 Supply-pump pressure bar: 5,0...5,6
 3rd speed 1/min: 1100
 Charge press. hPa: 1000
 Supply-pump pressure bar: 5,9...6,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Charge press. hPa: -
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 1250
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
 Charge-air pressure-setting point hPa: 550
 LDA stroke mm: 5,8
 Del.quantity cm³/: 72,0...73,0
 1000H.: (68,0...77,0)
 2nd speed 1/min: 1520
 Charge press. hPa: 1000
 Del.quantity cm³/: 0,0...3,0
 1000H.: -
 3rd speed 1/min: 1480
 Charge press. hPa: 1000
 Del.quantity cm³/: 0,0...15,0
 1000H.: -
 4th speed 1/min: 1440
 Charge press. hPa: 1000
 Del.quantity cm³/: 15,0...55,0
 1000H.: -
 5th speed 1/min: 1360
 Charge press. hPa: 1000
 Del.quantity cm³/: 58,5...64,5
 1000H.: (55,5...67,5)
 6th speed 1/min: 1250

Charge press. hPa: 1000
 Del.quantity cm³/: 77,0...80,0
 1000H.: (75,5...81,5)
 7th speed 1/min: 1100
 Charge press. hPa: 1000
 Del.quantity cm³/: 78,5...79,5
 1000H.: (76,0...82,0)
 8th speed 1/min: 750
 Charge press. hPa: 1000
 Del.quantity cm³/: 79,5...82,5
 1000H.: (78,0...84,0)
 9th speed 1/min: 700
 Charge press. hPa: 550
 Del.quantity cm³/: 72,0...73,0
 1000H.: (68,0...77,0)
 10th speed 1/min: 500
 Charge press. hPa: -
 Del.quantity cm³/: 64,5...65,5
 1000H.: (60,5...69,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
 Del.quantity cm³/: 0...3
 1000H.: -

Electr. shutoff:

Speed 1/min: 365
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 365
 Del.quantity cm³/: 9,5...13,5
 1000H.: (6,5...16,5)
 2nd speed 1/min: 450
 Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
 Del.quantity cm³/: -
 ind. 1000H.: 90,0
 2nd speed 1/min: 350
 Del.quantity cm³/: -
 max. 1000H.: 95,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: K-OT
MS	mm	: 0,6...1,0
SVS max.	mm	: 3,8
XK	mm	: 18,8...20,8
XL	mm	: 11,3...14,7

Remarks:

: C.D.C. # 390 7648

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,5 R
Edition : 03.05.90
replaces : 19.07.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1350 R329
Type number : 0 460 426 119

Customer-specific information
Customer : IVECO-FIAT

Engine : 8060.25.221

Power k: 114

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): +0,02(0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200
Charge press. hPa: 1000
Setting value mm: 3,0...3,4

Supply-pump pressure:

Speed 1/min: 1200
Charge press. hPa: 1000
Setting value bar: 7,7...8,3

Full-load del. with charge press.:

Speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 103,5...104,5
Dispersion cm3/ : 5,0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 66,6...67,5

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm3/
1000H.: 13,0...17,0
Dispersion cm3/ : 3,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 37,0...43,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 75,0

Load-dependent start of delivery:

Speed 1/min: 1200
Charge press. hPa: 1000

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 0,7...1,5
mm: (0,4...1,8)
2nd speed 1/min: 1200
Charge press. hPa: 1000

TD travel mm: 3,0...3,4
mm: (2,5...3,9)
3rd speed 1/min: 1350
Charge press. hPa: 1000
TD travel mm: 3,6...4,4
mm: (3,3...4,7)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 5,0...5,6
2nd speed 1/min: 900
Charge press. hPa: 1000
Supply-pump pressure bar: 6,6...7,2
3rd speed 1/min: 1200
Charge press. hPa: 1000
Supply-pump pressure bar: 7,7...8,3
4th speed 1/min: 1350
Charge press. hPa: 1000
Supply-pump pressure bar: 8,3...8,9

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: 1000
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1350
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 500*
Charge-air pressure-setting point hPa: 500
LDA stroke mm: 4,8
Del.quantity cm³: 81,0...82,0
1000H.: (78,5...84,5)
2nd speed 1/min: 1600
Charge press. hPa: 1000
Del.quantity cm³: 0,0...3,0
1000H.: -
3rd speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm³: 37,0...43,0
1000H.: (34,0...46,0)
4th speed 1/min: 1350
Charge press. hPa: 1000
Del.quantity cm³: 99,0...102,0
1000H.: (97,5...103,5)
5th speed 1/min: 1200
Charge press. hPa: 1000

Del.quantity cm³: 103,5...104,5
1000H.: (101,0...107,0)
6th speed 1/min: 800
Charge press. hPa: 1000
Del.quantity cm³: 98,5...101,5
1000H.: (97,0...103,0)
7th speed 1/min: 500
Charge press. hPa: 500
Del.quantity cm³: 81,0...82,0
1000H.: (78,5...84,5)
8th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³: 66,5...67,5
1000H.: (64,0...70,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1350
Del.quantity cm³: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
Del.quantity cm³: 13,0...17,0
1000H.: (10,0...20,0)
2nd speed 1/min: 450
Del.quantity cm³: 0,0...5,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150
Del.quantity cm³: -
ind. 1000H.: 85,0
2nd speed 1/min: 300
Del.quantity cm³: -
max. 1000H.: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4

MS mm : -
SVS max. mm : -

* Correction at adjusting nut (46)

Operate control lever after each
manifold-pressure compensator pressure
change.

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BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,5 R1
Edition : 03.05.90
replaces : 19.07.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1350 R329-1
Type number : 0 460 426 120

Customer-specific information
Customer : IVECO-FIAT

Engine : 8060.25.241

Power k: 100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 020

Opening
pressure bar : 172...175

Perforated-plate
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): +0,02(0,04)

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200
Charge press. hPa: 1000
Setting value mm: 3,0...3,4

Supply-pump pressure:

K20

Speed 1/min: 1200
Charge press. hPa: 1000
Setting value bar: 7,7...8,3

Full-load del. with charge press.:

Speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 96,0...97,0
Dispersion cm3/ : 5,0
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 66,6...67,5

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm3/
1000H.: 13,0...17,0
Dispersion cm3/ : 3,5
1000H.: -

Full-load speed regulation:

Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 37,0...43,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 75,0

Load-dependent start of delivery:

Speed 1/min: 1200
Charge press. hPa: 1000

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 0,7...1,5
mm: (0,4...1,8)
2nd speed 1/min: 1200
Charge press. hPa: 1000

TD travel mm: 3,0...3,4
mm: (2,5...3,9)
3rd speed 1/min: 1350
Charge press. hPa: 1000
TD travel mm: 3,6...4,4
mm: (3,3...4,7)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 5,0...5,6
2nd speed 1/min: 900
Charge press. hPa: 1000
Supply-pump pressure bar: 6,6...7,2
3rd speed 1/min: 1200
Charge press. hPa: 1000
Supply-pump pressure bar: 7,7...8,3
4th speed 1/min: 1350
Charge press. hPa: 1000
Supply-pump pressure bar: 8,3...8,9

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: 1000
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1350
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 500*
Charge-air pressure-setting point hPa: 500
LDA stroke mm: 3,0
Del.quantity cm³/: 81,0...82,0
1000H.: (78,5...84,5)
2nd speed 1/min: 1600
Charge press. hPa: 1000
Del.quantity cm³/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm³/: 37,^...43,0
1000H.: (34,0...46,0)
4th speed 1/min: 1350
Charge press. hPa: 1000
Del.quantity cm³/: 92,5...95,5
1000H.: (91,0...97,0)
5th speed 1/min: 1200
Charge press. hPa: 1000

Del.quantity cm³/: 96,0...97,0
1000H.: (93,5...99,5)
6th speed 1/min: 800
Charge press. hPa: 1000
Del.quantity cm³/: 90,5...93,5
1000H.: (89,0...95,0)
7th speed 1/min: 500
Charge press. hPa: 500
Del.quantity cm³/: 81,0...82,0
1000H.: (78,5...84,5)
8th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 66,5...67,5
1000H.: (64,0...70,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1350
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
Del.quantity cm³/: 13,0...17,0
1000H.: (10,0...20,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...5,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150
Del.quantity cm³/: -
ind. 1000H.: 85,0

2nd speed 1/min: 250
Del.quantity cm³/: -
max. 1000H.: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4

MS mm : -
SVS max. mm : -

* Correction at adjusting nut (46)

Operate control lever after each
manifold-pressure compensator pressure
change.



BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W29
Edition : 10.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R195-3
Type number : 0 460 426 122

Customer-specific information
Customer : CDC

Engine : 6 BT 5,9A

Power k: 117
Speed 1/mi: 2600

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 2,35
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value mm: 2,6...3,0

Supply-pump pressure:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value bar: 6,6...7,2

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 73,5...74,5
Dispersion cm3/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 50,5...51,5
Dispersion cm3/ : 9,0
1000H.: (9,0)

Low-idle speed regulation:

Speed 1/min: 350
Del.quantity cm3/
1000H.: 9,0...11,0
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 54,0...60,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700
Charge press. hPa: 1000
TD travel mm: 1,4...2,2
mm: (1,1...2,5)
2nd speed 1/min: 850

Charge press. hPa: 1000
TD travel mm: 2,6...3,0
mm: (2,1...3,5)
3rd speed 1/min: 1300
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 4,8...5,4
2nd speed 1/min: 850
Charge press. hPa: 1000
Supply-pump pressure bar: 6,6...7,2
3rd speed 1/min: 1300
Charge press. hPa: 1000
Supply-pump pressure bar: 8,6...9,2

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow quantity cm³/10s: 104...145
(89...160)
2nd speed 1/min: 1300
Charge press. hPa: 1000
Overflow quantity cm³/10s: 111...194
(96...209)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 475
LDA stroke mm: 5,8
Del.quantity cm³/: 63,0...64,0
1000H.: (59,5...67,5)
2nd speed 1/min: 1600
Charge press. hPa: 1000
Del.quantity cm³/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1540
Charge press. hPa: 1000
Del.quantity cm³/: 0,0...15,0
1000H.: -
4th speed 1/min: 1480
Charge press. hPa: 1000
Del.quantity cm³/: 15,0...55,0
1000H.: -
5th speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/: 54,0...60,0
1000H.: (51,0...63,0)
6th speed 1/min: 1300
Charge press. hPa: 1000

Del.quantity cm³/: 65,0...68,0
1000H.: (63,5...69,5)
7th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 69,5...72,5
1000H.: (67,5...74,5)
8th speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/: 73,5...74,5
1000H.: (71,0...77,0)
9th speed 1/min: 700
Charge press. hPa: 475
Del.quantity cm³/: 63,0...64,0
1000H.: (59,5...67,5)
10th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 82,5...92,5
1000H.: -
11th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 50,5...51,5
1000H.: (47,0...55,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1300
Del.quantity cm³/: -
1000H.: 0...3

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
Del.quantity cm³/: 9,0...11,0
1000H.: (5,0...15,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
Del.quantity cm³/: -
ind. 1000H.: 50,0
2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H.: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: K-OT
MS	mm	: 1,2...1,6
SVS max.	mm	: 2,2
XK	mm	: 21,8...23,8
XL	mm	: 9,7...13,1

Remarks:

: C.D.C. # 391 2828

* Correction at adjusting nut (46)

Operate control lever after each
manifold-pressure compensator pressure
change.

Overflow restriction 0.75 mm - Part No.
..343,..344

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W31
Edition : 18.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1400 R195-4
Type number : 0 460 426 123

Customer-specific information
Customer : CDC

Engine : 6 BT 5.9A

Power k: 106
Speed 1/mi: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 2,35
mm: +0,02(0,06)

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value mm: 2,2...2,6

Supply-pump pressure:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value bar: 4,7...5,3

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 57,0...58,0
Dispersion cm3/ : 4,0
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 44,5...45,5

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm3/
1000H.: 6,5...10,5
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1520
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 41,0...47,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 50,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 1,0...1,8
mm: (0,7...2,1)
2nd speed 1/min: 1000
Charge press. hPa: 1000

TD travel mm: 2,2...2,6
mm: (1,7...3,1)
3rd speed 1/min: 1400
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 4,7...5,3
2nd speed 1/min: 1000
Charge press. hPa: 1000
Supply-pump pressure bar: 7,1...7,7
3rd speed 1/min: 1400
Charge press. hPa: 1000

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 104...145
quantity cm³/10s: (89...160)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Overflow : 111...194
quantity cm³/10s: (96...209)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 300
LDA stroke mm: 5,8
Del.quantity cm³/: 50,0...51,0
1000H.: (46,5...54,5)
2nd speed 1/min: 1680
Charge press. hPa: 1000
Del.quantity cm³/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1590
Charge press. hPa: 1000
Del.quantity cm³/: 15,0...55,0
1000H.: -
4th speed 1/min: 1520
Charge press. hPa: 1000
Del.quantity cm³/: 41,0...47,0
1000H.: (38,0...50,0)
5th speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/: 57,5...60,5
1000H.: (56,0...62,0)
6th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 58,0...61,0
1000H.: (56,0...63,0)
7th speed 1/min: 850

Charge press. hPa: 1000
Del.quantity cm³/: 57,0...58,0
1000H.: (54,5...60,5)
8th speed 1/min: 700
Charge press. hPa: 300
Del.quantity cm³/: 50,0...51,0
1000H.: (46,5...54,5)
9th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 44,5...45,5
1000H.: (41,0...49,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 6,5...10,5
1000H.: (3,5...13,5)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 230
Del.quantity cm³/: -
ind. 1000H.: 65,0
2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H.: 65,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K mm : -
KF : K-OT
MS mm : 1,0...1,4
SVS max. mm : 2,2
XK mm : 21,8...23,8

XL mm : 10,4...13,8

Remarks: : C.D.C. # 391 2832

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

Overflow restriction 0.75 mm - Part No.
..343,..344

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W32
Edition : 18.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1400 R195-5
Type number : 0 460 426 124

Customer-specific information
Customer : CDC

Engine : 6 BT 5.9A

Power k: 113
Speed 1/mi: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 2,25
mm: $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

LD1

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value mm: 1,8...2,2

Supply-pump pressure:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value bar: 5,8...6,4

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 61,5...62,5
Dispersion cm3/ : 4,0
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 50,0...51,0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm3/
1000H.: 5,0...9,0
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1520
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 47,5...53,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 55,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 0,5...1,3
mm: (0,2...1,6)
2nd speed 1/min: 1000
Charge press. hPa: 1000

TD travel mm: 1,8...2,2
mm: (1,3...2,7)
3rd speed 1/min: 1400
Charge press. hPa: 1000
TD travel mm: 2,9...3,7
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 3,4...4,0
2nd speed 1/min: 1000
Charge press. hPa: 1000
Supply-pump pressure bar: 5,8...6,4
3rd speed 1/min: 1400
Charge press. hPa: 1000
Supply-pump pressure bar: 7,5...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 104...145
quantity cm³/10s: (89...160)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Overflow : 111...194
quantity cm³/10s: (96...209)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 350
LDA stroke mm: -
Del.quantity cm³/: 56,5...57,5
1000H.: (53,0...61,0)
2nd speed 1/min: 1700
Charge press. hPa: 1000
Del.quantity cm³/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1600
Charge press. hPa: 1000
Del.quantity cm³/: 15,0...55,0
1000H.: -
4th speed 1/min: 1520
Charge press. hPa: 1000
Del.quantity cm³/: 47,5...53,5
1000H.: (44,5...56,5)
5th speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/: 60,0...63,0
1000H.: (58,5...64,5)
6th speed 1/min: 1100
Charge press. hPa: 1000

Del.quantity cm³/: 62,0...65,0
1000H.: (60,0...67,0)
7th speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/: 61,5...62,5
1000H.: (59,0...65,0)
8th speed 1/min: 700
Charge press. hPa: 350
Del.quantity cm³/: 56,5...57,5
1000H.: (53,0...61,0)
9th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 50,0...51,0
1000H.: (46,5...54,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 5,0...9,0
1000H.: (2,0...12,0)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 270
Del.quantity cm³/: -
ind. 1000H.: 65,0
2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H.: 75,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : K-OT

MS	mm	: 0,6...1,0
SVS max.	mm	: 2,0
XK	mm	: 21,8...23,8
XL	mm	: 10,1...13,5

Remarks:

: C.D.C. # 391 2834

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Overflow restriction 0.75 mm - Part No. ..343,..344

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U16
Edition : 03.05.90
replaces : 02.02.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R173-11
Type number : 0 460 426 125

Customer-specific information
Customer : CDC

Engine : 6BTA- 5.9 I

Power k: 124
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.85
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 1.5...1.9

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 2.9...3.5

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 94.5...95.5
Dispersion cm³/
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 50.5...51.5
Dispersion cm³/
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 8.0...12.0
Dispersion cm³/
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 73.0...79.0

Start: -

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0.5...1.3
mm: (0.2...1.6)
2nd speed 1/min: 750

Charge press. hPa: 1000
TD travel mm: 1.5...1.9
mm: (1.0...2.4)
3rd speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 2.5...3.3
mm: (2.2...3.6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 1.8...2.4
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 2.9...3.5
3rd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump pressure bar: 4.3...4.9

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 300
LDA stroke mm: -
Del.quantity cm³/: 79.5...80.5
1000H.: (76.5...84.5)
2nd speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1170
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...15.0
1000H.: -
4th speed 1/min: 1140
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
5th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 73.0...79.0
1000H.: (70.0...82.0)
6th speed 1/min: 1050
Charge press. hPa: 1000

Del.quantity cm³/: 83.5...86.5
1000H.: (82.0...88.0)
7th speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm³/: 87.5...90.5
1000H.: (86.0...92.0)
8th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 94.5...95.5
1000H.: (92.0...98.0)
9th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 98.0...106.0
1000H.: -
10th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 50.5...51.5
1000H.: (46.5...55.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...12.0
1000H.: (5.0...15.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
Del.quantity cm³/: -
ind. 1000H: 45.0
2nd speed 1/min: 450
Del.quantity cm³/: -
max. 1000H : 55.0

Shutoff electromagnet:

Cut-in
min. voltage : 20.0
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 1.2...1.6
SVS max.	mm	: 1.2
XK	mm	: 21,8...23,8
XL	mm	: 14,1...17,5

Remarks:

: C.D.C. # 3 915 516

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W33
Edition : 19.04.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1050 225-21
Type number : 0 460 426 131

Customer-specific information
Customer : CDC

Engine : 6 BT

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm : 1,5
mm: $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 35...3,9

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,3...4,9

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 80,5...81,5
Dispersion cm³/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 500
Del.quantity cm³/
1000H.: 9,0...15,0
Dispersion cm³/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1100
Del.quantity cm³/
1000H.: 50,0...56,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 80,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 2,1...2,9
mm: (1,8...3,2)
2nd speed 1/min: 900
TD travel mm: 3,5...3,9
mm: (3,0...4,4)
3rd speed 1/min: 1050
TD travel mm: 4,6...5,4
mm: (4,3...5,7)

Supply-pump pressure characteristic:

1st speed 1/min: 750
Supply-pump
pressure bar: 3,7...4,3
2nd speed 1/min: 900
Supply-pump
pressure bar: 4,3...4,9
3rd speed 1/min: 1050

Supply-pump
pressure

bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1130
Del.quantity cm³/: 15,0...45,0
1000H.: -
3rd speed 1/min: 1100
Del.quantity cm³/: 50,0...56,0
1000H.: (47,0...59,0)
4th speed 1/min: 1050
Del.quantity cm³/: 65,0...68,0
1000H.: (63,5...69,5)
5th speed 1/min: 900
Del.quantity cm³/: 69,0...73,0
1000H.: (67,0...75,0)
6th speed 1/min: 750
Del.quantity cm³/: 80,5...81,5
1000H.: (78,0...84,0)
7th speed 1/min: 500
Del.quantity cm³/: 78,5...86,5
1000H.: (76,5...88,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 500
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 500
Del.quantity cm³/: 9,0...15,0
1000H.: (7,0...17,0)
2nd speed 1/min: 560
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 80,0

2nd speed 1/min: 250
Del.quantity cm³/: -
max. 1000H : 75,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	1,2...1,6
SVS max.	mm	:	2,4
XK	mm	:	-
XL	mm	:	-

Remarks:

: C.D.C. # 391 7553

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W34
Edition : 19.04.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1100 R225-22
Type number : 0 460 426 132

Customer-specific information
Customer : CDC

Engine : 6 BT

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm : 1,85
mm : $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2,4...2,8

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 3,8...4,4

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 92,0...93,0
Dispersion cm³/
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm³/
1000H.: 7,0...13,0

Full-load speed regulation:

Speed 1/min: 1190
Del.quantity cm³/
1000H.: 15,0...25,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1,3...2,1
mm: (1,0...2,4)
2nd speed 1/min: 900
TD travel mm: 2,4...2,8
mm: (1,9...3,3)
3rd speed 1/min: 1100
TD travel mm: 3,0...3,8
mm: (2,7...4,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,2...2,8
2nd speed 1/min: 750
Supply-pump
pressure bar: 3,2...3,8
3rd speed 1/min: 900
Supply-pump
pressure bar: 3,8...4,4
4th speed 1/min: 1100

Supply-pump
pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1230
Del.quantity cm³/: 0,0...15,0
1000H.: -
3rd speed 1/min: 1190
Del.quantity cm³/: 15,0...25,0
1000H.: -
4th speed 1/min: 1100
Del.quantity cm³/: 75,0...78,0
1000H.: (73,5...79,5)
5th speed 1/min: 900
Del.quantity cm³/: 80,5...83,5
1000H.: (78,5...85,5)
6th speed 1/min: 750
Del.quantity cm³/: 92,0...93,0
1000H.: (89,5...95,5)
7th speed 1/min: 500
Del.quantity cm³/: 91,0...101,0
1000H.: (90,0...102,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
Del.quantity cm³/: 7,0...13,0
1000H.: (5,0...15,0)
2nd speed 1/min: 470
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,5
MS	mm	: 0,8...1,2
SVS max.	mm	: 2,2
XK	mm	: 18,8...20,8
XL	mm	: 11,9...15,3

Remarks:

: C.D.C. # 391 9458

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W41
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R225-22
Type number : 0 460 426 132
Customer Part-No. : 3 917 009

Customer-specific information
Customer : CDC

Engine : 6 BT

Power k: 119
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,85
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2,4...2,8

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 3,8...4,4

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 92,0...93,0
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm3/
1000H.: 7,0...13,0

Full-load speed regulation:

Speed 1/min: 1190
Del.quantity cm3/
1000H: 15,0...25,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1,3...2,1
mm: (1,0...2,4)
2nd speed 1/min: 900
TD travel mm: 2,4...2,8
mm: (1,9...3,3)
3rd speed 1/min: 1100
TD travel mm: 3,0...3,8
mm: (2,7...4,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,2...2,8
2nd speed 1/min: 750
Supply-pump
pressure bar: 3,2...3,8

3rd speed 1/min: 900
Supply-pump pressure bar: 3,8...4,4
4th speed 1/min: 1100
Supply-pump pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1230
Del.quantity cm³/: 0,0...15,0
1000H.: -
3rd speed 1/min: 1190
Del.quantity cm³/: 15,0...25,0
1000H.: -
4th speed 1/min: 1100
Del.quantity cm³/: 75,0...78,0
1000H.: (73,5...79,5)
5th speed 1/min: 900
Del.quantity cm³/: 80,5...83,5
1000H.: (78,5...85,5)
6th speed 1/min: 750
Del.quantity cm³/: 92,0...93,0
1000H.: (89,5...95,5)
7th speed 1/min: 500
Del.quantity cm³/: 91,0...101,0
1000H.: (90,0...102,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
Del.quantity cm³/: 7,0...13,0
1000H.: (5,0...15,0)

2nd speed 1/min: 470
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,1...5,5
MS mm : 0,8...1,2
SVS max. mm : 2,2
XK mm : 18,8...20,8
XL mm : 11,9...15,3

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,8 W38
Edition : 24.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R320-2
Type number : 0 460 426 139

Customer-specific information
Customer : CDC

Engine : 6 BT

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm : 0,4
mm : $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1200

Setting value mm: 1,3...1,7
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1200
Setting value bar: 6,8...7,4
KSB solenoid-operated
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 1100
Charge press. hPa: 1200
Del.quantity cm³/
1000H.: 73,0...74,0
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³ : 4,0
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 51,0...52,0
Dispersion cm³ : -
1000H.: (9,0)

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm³/
1000H.: 5,5...9,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340
Charge press. hPa: 1200
Del.quantity cm³/
1000H.: 52,5...58,5
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70,0
KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450*
 Charge press. hPa: -
 TD travel mm: 3,0...4,0
 mm: -
 KSB solenoid-operated
 valve volt: -
 2nd speed 1/min: 1000
 Charge press. hPa: 1200
 TD travel mm: 0,5...1,3
 mm: (0,,2...1,6)
 KSB solenoid-operated
 valve volt: 12,0
 3rd speed 1/min: 1100
 Charge press. hPa: 1200
 TD travel mm: 1,3...1,7
 mm: (0,8...2,2)
 KSB solenoid-operated
 valve volt: 12,0
 4th speed 1/min: 1250
 Charge press. hPa: 1200
 TD travel mm: 2,2...3,0
 mm: (1,9...3,3)
 KSB solenoid-operated
 valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1200
 Supply-pump
 pressure bar: 4,1...4,7
 KSB solenoid-operated
 valve volt: 12,0
 2nd speed 1/min: 1100
 Charge press. hPa: 1200
 Supply-pump
 pressure bar: 6,8...7,4
 KSB solenoid-operated
 valve volt: 12,0
 3rd speed 1/min: 1250
 Charge press. hPa: 1200
 Supply-pump
 pressure bar: 7,5...8,1
 KSB solenoid-operated
 valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Charge press. hPa: -
 KSB solenoid-operated
 valve volt: 12,0
 Overflow : 41...83
 quantity cm3/10s: (26...98)
 2nd speed 1/min: 1250

Charge press. hPa: 1200
 KSB solenoid-operated
 valve volt: 12,0
 Overflow : 55...138
 quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
 Charge-air pressure-setting
 point hPa: 700
 LDA stroke mm: 6,8
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 68,0...69,0
 1000H.: (64,5...72,5)
 2nd speed 1/min: 1550
 Charge press. hPa: 1200
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 0,0...3,0
 1000H.: -
 3rd speed 1/min: 1400
 Charge press. hPa: 1200
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 15,0...55,0
 1000H.: -
 4th speed 1/min: 1340
 Charge press. hPa: 1200
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 52,5...58,5
 1000H.: (49,5...61,5)
 5th speed 1/min: 1250
 Charge press. hPa: 1200
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 70,5...73,5
 1000H.: (69,0...75,0)
 6th speed 1/min: 1100
 Charge press. hPa: 1200
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 73,0...74,0
 1000H.: (70,5...76,5)
 7th speed 1/min: 750
 Charge press. hPa: 1200
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 72,0...77,0
 1000H.: (70,0...79,0)
 8th speed 1/min: 700
 Charge press. hPa: 700
 KSB solenoid-operated
 valve volt: 12,0
 Del.quantity cm3/: 68,0...69,0
 1000H.: (64,5...72,5)
 9th speed 1/min: 500
 Charge press. hPa: -

KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 51,0...52,0
1000H: (47,5...55,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 5,5...9,5
1000H.: (2,5...12,5)
2nd speed 1/min: 450
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 250
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
max. 1000H : 50,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,6...3,8
KF mm : K-OT
MS mm : 0,8...1,2
SVS max. mm : 1,4

Remarks:

: C.D.C. # 391 7943

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for
DI-engines; only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,8 W39
Edition : 24.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R320-2
Type number : D 460 426 139
Customer Part-No. : 3 916 896

Customer-specific information
Customer : CDC

Engine : 6 BT

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm : 0,4
mm : $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100

Charge press. hPa: 1200
Setting value mm: 1,3...1,7
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1200
Setting value bar: 6,8...7,4
KSB solenoid-operated
valve volt: 12,0

Full-load del. with charge press.:

Speed 1/min: 1100
Charge press. hPa: 1200
Del.quantity cm³/
1000H.: 73,0...74,0
KSB solenoid-operated
valve volt : 12,0
Dispersion cm³/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 51,0...52,0
Dispersion cm³/: -
1000H.: (9,0)

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm³/
1000H.: 5,5...9,5
KSB solenoid-operated
valve volt: 12,0
Dispersion cm³/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340
Charge press. hPa: 1200
Del.quantity cm³/
1000H: 52,5...58,5
KSB solenoid-operated
valve volt: 12,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70,0
KSB solenoid-operated
valve volt: 12,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450*
Charge press. hPa: -
TD travel mm: 3,0...4,0
mm: -
KSB solenoid-operated
valve volt: -
2nd speed 1/min: 1000
Charge press. hPa: 1200
TD travel mm: 0,5...1,3
mm: (0,2...1,6)
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1100
Charge press. hPa: 1200
TD travel mm: 1,3...1,7
mm: (0,8...2,2)
KSB solenoid-operated
valve volt: 12,0
4th speed 1/min: 1250
Charge press. hPa: 1200
TD travel mm: 2,2...3,0
mm: (1,9...3,3)
KSB solenoid-operated
valve volt: 12,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1200
Supply-pump
pressure bar: 4,1...4,7
KSB solenoid-operated
valve volt: 12,0
2nd speed 1/min: 1100
Charge press. hPa: 1200
Supply-pump
pressure bar: 6,8...7,4
KSB solenoid-operated
valve volt: 12,0
3rd speed 1/min: 1250
Charge press. hPa: 1200
Supply-pump
pressure bar: 7,5...8,1
KSB solenoid-operated
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Overflow : 41...83
quantity cm³/10s: (26...98)

2nd speed 1/min: 1250
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 700
LDA stroke mm: 6,8
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 68,0...69,0
1000H.: (64,5...72,5)
2nd speed 1/min: 1550
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1400
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 15,0...55,0
1000H.: -
4th speed 1/min: 1340
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 52,5...58,5
1000H.: (49,5...61,5)
5th speed 1/min: 1250
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 70,5...73,5
1000H.: (69,0...75,0)
6th speed 1/min: 1100
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 73,0...74,0
1000H.: (70,5...76,5)
7th speed 1/min: 750
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 72,0...77,0
1000H.: (70,0...79,0)
8th speed 1/min: 700
Charge press. hPa: 700
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 68,0...69,0
1000H.: (64,5...72,5)
9th speed 1/min: 500

Charge press. hPa: -
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 51,0...52,0
1000H: (47,5...55,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 5,5...9,5
1000H.: (2,5...12,5)

2nd speed 1/min: 450
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 250
KSB solenoid-operated
valve volt: 12,0
Del.quantity cm³/: -
max. 1000H : 50,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,6...3,8
KF mm : K-0T
MS mm : 0,8...1,2

SVS max. mm : 1,4

Remarks:

:

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,8 W40
Edition : 24.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R320-2
Type number : 0 460 426 139
Customer Part-No. : 3 916 897

Customer-specific information
Customer : CDC

Engine : 6 BT

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : -
(from BDC): -

Start of delivery block
Piston stroke mm : 0,4
mm : +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100

Charge press. hPa: 1200
Setting value mm: 1,3...1,7
KSB solenoid-operated
valve volt: 24,0

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1200
Setting value bar: 6,8...7,4
KSB solenoid-operated
valve volt: 24,0

Full-load del. with charge press.:

Speed 1/min: 1100
Charge press. hPa: 1200
Del.quantity cm3/
1000H.: 73,0...74,0
KSB solenoid-operated
valve volt : 24,0
Dispersion cm3/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 51,0...52,0
KSB solenoid-operated
valve volt: 24,0
Dispersion cm3/ : -
1000H.: (9,0)

Low-idle speed regulation:

Speed 1/min: 350
Charge press. hPa: -
Del.quantity cm3/
1000H.: 5,5...9,5
KSB solenoid-operated
valve volt: 24,0
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1340
Charge press. hPa: 1200
Del.quantity cm3/
1000H.: 52,5...58,5
KSB solenoid-operated
valve volt: 24,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70,0

KSB solenoid-operated
valve volt: 24,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 450*
Charge press. hPa: -
TD travel mm: 3,0...4,0
mm: -

KSB solenoid-operated
valve volt: -
2nd speed 1/min: 1000
Charge press. hPa: 1200
TD travel mm: 0,5...1,3
mm: (0,,2...1,6)

KSB solenoid-operated
valve volt: 24,0
3rd speed 1/min: 1100
Charge press. hPa: 1200
TD travel mm: 1,3...1,7
mm: (0,8...2,2)

KSB solenoid-operated
valve volt: 24,0
4th speed 1/min: 1250
Charge press. hPa: 1200
TD travel mm: 2,2...3,0
mm: (1,9...3,3)

KSB solenoid-operated
valve volt: 24,0

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1200
Supply-pump
pressure bar: 4,1...4,7

KSB solenoid-operated
valve volt: 24,0
2nd speed 1/min: 1100
Charge press. hPa: 1200
Supply-pump
pressure bar: 6,8...7,4

KSB solenoid-operated
valve volt: 24,0
3rd speed 1/min: 1250
Charge press. hPa: 1200
Supply-pump
pressure bar: 7,5...8,1

KSB solenoid-operated
valve volt: 24,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -

KSB solenoid-operated
valve volt: 24,0
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
point hPa: 700
LDA stroke mm: 6,8
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 68,0...69,0
1000H.: (64,5...72,5)

2nd speed 1/min: 1550
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 0,0...3,0
1000H.: -

3rd speed 1/min: 1400
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 15,0...55,0
1000H.: -

4th speed 1/min: 1340
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 52,5...58,5
1000H.: (49,5...61,5)

5th speed 1/min: 1250
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 70,5...73,5
1000H.: (69,0...75,0)

6th speed 1/min: 1100
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 73,0...74,0
1000H.: (70,5...76,5)

7th speed 1/min: 750
Charge press. hPa: 1200
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 72,0...77,0
1000H.: (70,0...79,0)

8th speed 1/min: 700
Charge press. hPa: 700

KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 68,0...69,0
1000H: (64,5...72,5)
9th speed 1/min: 500
Charge press. hPa: -
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 51,0...52,0
1000H: (47,5...55,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 5,5...9,5
1000H.: (2,5...12,5)
2nd speed 1/min: 450
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 250
KSB solenoid-operated
valve volt: 24,0
Del.quantity cm³/: -
max. 1000H : 50,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,6...3,8
KF mm : K-OT
MS mm : 0,8...1,2
SVS max. mm : 1,4

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

* Unscrew KSB ball valve 2 mm

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U41
Edition : 04.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R373
Type number : 0 460 426 142
Customer Part-No. : 3 917 003

Customer-specific information
Customer : CUMMINS

Engine : 6 BTA

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm : 1,85
mm : +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Charge press. hPa: 1000
Setting value mm: 1,3...1,7

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3,2...3,8

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 84,5...85,5
Dispersion cm3/ : 4,0
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 68,5...69,5

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 59,0...65,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0,4...1,2
mm: (0,1...1,5)
2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1,3...1,7
mm: (0,8...2,2)

3rd speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 2,0...2,8
mm: (1,7...3,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 2,2...2,8
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 3,2...3,8
3rd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump pressure bar: 4,5...5,1

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 400
LDA stroke mm: 5,0
Del.quantity cm3/: 77,5...78,5
1000H.: (74,0...82,0)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm3/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1370
Charge press. hPa: 1000
Del.quantity cm3/: 0,0...15,0
1000H.: -
4th speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm3/: 15,0...55,0
1000H.: -
5th speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm3/: 59,0...65,0
1000H.: (56,0...68,0)
6th speed 1/min: 1250
Charge press. hPa: 1000
Del.quantity cm3/: 76,0...79,0
1000H.: (74,5...80,5)
7th speed 1/min: 1050

Charge press. hPa: 1000
Del.quantity cm3/: 80,5...83,5
1000H.: (78,5...85,5)
8th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm3/: 84,5...85,5
1000H.: (82,0...88,0)
9th speed 1/min: 700
Charge press. hPa: 400
Del.quantity cm3/: 77,5...78,5
1000H.: (74,0...82,0)
10th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm3/: 84,0...92,0
1000H.: -
11th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm3/: 68,5...69,5
1000H.: (65,0...73,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm3/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm3/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm3/: 8,0...14,0
1000H.: (6,0...16,0)
2nd speed 1/min: 500
Del.quantity cm3/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
Charge press. hPa: -
Del.quantity cm3/: -
ind. 1000H: 70,0
2nd speed 1/min: 450
Charge press. hPa: -
Del.quantity cm3/: -
max. 1000H : 88,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0

Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,0...5,4
MS	mm	: 1,0...1,4
SVS max.	mm	: 2,0
XK	mm	: 21,8...23,8
XL	mm	: 13,8...17,2

Remarks:

:

* Correction at adjusting nut (46)

Operate control lever after each manifold-pressure compensator pressure change.

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U44
Edition : 04.05.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1250 R373
Type number : 0 460 426 142
Customer Part-No. : 3 917 017

Customer-specific information
Customer : CUMMINS

Engine : 6 BTA

Power k: 131
Speed 1/mi: 2400

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 1,85
mm: $\pm 0,02(0,06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 1,3...1,7

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3,2...3,8

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 89,5...90,5
Dispersion cm3/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 65,0...66,0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1260
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 69,5...75,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 40,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0,4...1,2
mm: (0,1...1,5)
2nd speed 1/min: 750

Charge press. hPa: 1000
 TD travel mm: 1,3...1,7
 mm: (0,8...2,2)
 3rd speed 1/min: 1050
 Charge press. hPa: 1000
 TD travel mm: 2,0...2,8
 mm: (1,7...3,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 2,2...2,8
 2nd speed 1/min: 750
 Charge press. hPa: 1000
 Supply-pump pressure bar: 3,2...3,8
 3rd speed 1/min: 1050
 Charge press. hPa: 1000
 Supply-pump pressure bar: 4,5...5,1

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Charge press. hPa: -
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 1250
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
 Charge-air pressure-setting point hPa: 550
 LDA stroke mm: 5,0
 Del.quantity cm³/: 77,5...78,5
 1000H.: (74,0...82,0)
 2nd speed 1/min: 1330
 Charge press. hPa: 1000
 Del.quantity cm³/: 0,0...3,0
 1000H.: -
 3rd speed 1/min: 1300
 Charge press. hPa: 1000
 Del.quantity cm³/: 15,0...55,0
 1000H.: -
 4th speed 1/min: 1260
 Charge press. hPa: 1000
 Del.quantity cm³/: 69,5...75,5
 1000H.: (66,5...78,5)
 5th speed 1/min: 1250
 Charge press. hPa: 1000
 Del.quantity cm³/: 76,5...79,5
 1000H.: (75,0...81,0)
 6th speed 1/min: 1050
 Charge press. hPa: 1000

Del.quantity cm³/: 85,0...88,0
 1000H.: (83,0...90,0)
 7th speed 1/min: 750
 Charge press. hPa: 1000
 Del.quantity cm³/: 89,5...90,5
 1000H.: (87,0...93,0)
 8th speed 1/min: 700
 Charge press. hPa: 550
 Del.quantity cm³/: 77,5...78,5
 1000H.: (74,0...82,0)
 9th speed 1/min: 500
 Charge press. hPa: -
 Del.quantity cm³/: 65,0...66,0
 1000H.: (61,5...69,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
 Del.quantity cm³/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 375
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
 Del.quantity cm³/: 8,0...14,0
 1000H.: (6,0...16,0)
 2nd speed 1/min: 500
 Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
 Charge press. hPa: -
 Del.quantity cm³/: -
 ind. 1000H: 70,0
 2nd speed 1/min: 450
 Charge press. hPa: -
 Del.quantity cm³/: -
 max. 1000H : 88,0

Shutoff electromagnet:

Cut-in
 min. voltage : 20,0
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,0...5,4
MS	mm	: 1,0...1,4
SVS max.	mm	: 2,0
XK	mm	: 21,8...23,8
XL	mm	: 13,8...17,2

Remarks:

:

* Correction at adjusting nut (46)

Operate control lever after each manifold-pressure compensator pressure change.

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 U36
Edition : 03.05.90
replaces : 23.10.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R373-2
Type number : 0 460 426 145

Customer-specific information
Customer : CDC

Engine : 6 BTA - 5.9 IND.

Power k: 124
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.85
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 1.5...1.9

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 2.9...3.5

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 94.5...95.5
Dispersion cm³/
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 50.5...51.5
Dispersion cm³/
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm³/
1000H.: 8.0...12.0
Dispersion cm³/
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 73.0...79.0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000

TD travel mm: 0.5...1.4
mm: (0.2...1.6)
2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1.5...1.9
mm: (1.0...2.4)
3rd speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 2.5...3.4
mm: (2.2...3.6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 1.8...2.4
bar: (1.6...2.6)
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 2.9...3.5
bar: (2.7...3.7)
3rd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump pressure bar: 4.3...4.9
bar: (4.1...5.1)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 300
LDA stroke mm: 7,3
Del.quantity cm³/: 79.5...80.5
1000H.: (75.5...84.5)
2nd speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
3rd speed 1/min: 1140
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
4th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 73.0...79.0
1000H.: (70.0...82.0)

5th speed 1/min: 1050
Charge press. hPa: 1000
Del.quantity cm³/: 83.5...86.5
1000H.: (82.0...88.0)
6th speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm³/: 87.5...90.5
1000H.: (86.0...92.0)
7th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 94.5...95.5
1000H.: (92.0...98.0)
8th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 98.0...106.0
1000H.: -
9th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 50.5...51.5
1000H.: (46.5...55.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...12.0
1000H.: (5.0...15.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 250
Charge press. hPa: -
Del.quantity cm³/: -
ind. 1000H: 45.0
2nd speed 1/min: 450
Charge press. hPa: -
Del.quantity cm³/: -
max. 1000H : 55.0

Shutoff electromagnet:

Cut-in
min. voltage : 20.0
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 1.2...1.6
SVS max.	mm	: 1.2

Remarks:

Operate control lever after each 7000
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W43
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R373-2
Type number : 0 460 426 145
Customer Part-No. : 3 916 989

Customer-specific information
Customer : CDC

Engine : 6 BTA - 5.9 IND.

Power k: 124
Speed 1/mi: 2000

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.85
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 1.5...1.9

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3,5...4,1

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 96,5...97.5
Dispersion cm³/ : 4.0
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 64,5...65.5
Dispersion cm³/ : 9.0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm³/
1000H.: 9.0...13.0
Dispersion cm³/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1040
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 76,5...82,5

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000

TD travel mm: 0.7...1.5
 mm: (0.4...1.8)
 2nd speed 1/min: 750
 Charge press. hPa: 1000
 TD travel mm: 1.6...2,0
 mm: (1.1...2.5)
 3rd speed 1/min: 1000
 Charge press. hPa: 1000
 TD travel mm: 2.1...2,9
 mm: (1,8...3.2)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 2,5...3,1
 2nd speed 1/min: 750
 Charge press. hPa: 1000
 Supply-pump pressure bar: 3,5...4,1
 3rd speed 1/min: 1000
 Charge press. hPa: 1000
 Supply-pump pressure bar: 4.5...5,1

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Charge press. hPa: -
 Overflow : 41...83
 quantity cm3/10s: (26...98)
 2nd speed 1/min: 1000
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
 Charge-air pressure-setting point hPa: 450
 LDA stroke mm: 7,3
 Del.quantity cm3/: 86.5...87.5
 1000H.: (82,5...91.5)
 2nd speed 1/min: 1120
 Charge press. hPa: 1000
 Del.quantity cm3/: 0.0...15,0
 1000H.: -
 3rd speed 1/min: 1080
 Charge press. hPa: 1000
 Del.quantity cm3/: 15.0...55.0
 1000H.: -
 4th speed 1/min: 1040
 Charge press. hPa: 1000
 Del.quantity cm3/: 76,5...82,5
 1000H.: (73,5...85,5)
 5th speed 1/min: 1000
 Charge press. hPa: 1000

Del.quantity cm3/: 86,5...89.5
 1000H.: (85.0...91.0)
 6th speed 1/min: 850
 Charge press. hPa: 1000
 Del.quantity cm3/: 91,5...94.5
 1000H.: (90.0...96.0)
 7th speed 1/min: 750
 Charge press. hPa: 1000
 Del.quantity cm3/: 96.5...97.5
 1000H.: (94.0...100,0)
 8th speed 1/min: 500
 Charge press. hPa: 1000
 Del.quantity cm3/: 98,0...106,0
 1000H.: (96,0...108,0)
 9th speed 1/min: 500
 Charge press. hPa: -
 Del.quantity cm3/: 64,5...65,5
 1000H.: (60,5...69,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1000
 Del.quantity cm3/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 375
 ELAB volt: -
 Del.quantity cm3/: 0.0...3.0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
 Del.quantity cm3/: 9.0...13.0
 1000H.: (6.0...16.0)
 2nd speed 1/min: 500
 Del.quantity cm3/: 0.0...4.0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
 Charge press. hPa: -
 Del.quantity cm3/: -
 ind. 1000H: 45.0
 2nd speed 1/min: 450
 Charge press. hPa: -
 Del.quantity cm3/: -
 max. 1000H : 55.0

Shutoff electromagnet:

Cut-in
 min. voltage : 10.0
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 1.2...1.6
SVS max.	mm	: 1.2

Remarks:

:
Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W44
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R373-2
Type number : 0 460 426 145
Customer Part-No. : 3 916 990

Customer-specific information
Customer : CDC

Engine : 6 BTA - 5.9 IND.

Power k: 124
Speed 1/mi: 2000

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.85
mm: $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 1.5...1.9

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3,5...4,1

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 96,5...97.5
Dispersion cm³/ : 4.0
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 64,5...65.5
Dispersion cm³/ : 9.0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm³/
1000H.: 9.0...13.0
Dispersion cm³/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1040
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 76,5...82,5

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000

TD travel mm: 0.7...1.5
mm: (0.4...1.8)
2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1.6...2,0
mm: (1.1...2.5)
3rd speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 2.1...2,9
mm: (1,8...3.2)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 2,5...3,1
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 3,5...4,1
3rd speed 1/min: 1000
Charge press. hPa: 1000
Supply-pump pressure bar: 4.5...5,1

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1000
Charge press. hPa: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 450
LDA stroke mm: 7,3
Del.quantity cm3/: 86,5...87,5
1000H.: (82,5...91,5)
2nd speed 1/min: 1120
Charge press. hPa: 1000
Del.quantity cm3/: 0.0...15,0
1000H.: -
3rd speed 1/min: 1080
Charge press. hPa: 1000
Del.quantity cm3/: 15.0...55.0
1000H.: -
4th speed 1/min: 1040
Charge press. hPa: 1000
Del.quantity cm3/: 76,5...82,5
1000H.: (73,5...85,5)
5th speed 1/min: 1000
Charge press. hPa: 1000

Del.quantity cm3/: 86,5...89,5
1000H.: (85,0...91,0)
6th speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/: 91,5...94,5
1000H.: (90,0...96,0)
7th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm3/: 96,5...97,5
1000H.: (94,0...100,0)
8th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm3/: 98,0...106,0
1000H.: (96,0...108,0)
9th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm3/: 64,5...65,5
1000H.: (60,5...69,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1000
Del.quantity cm3/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm3/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm3/: 9.0...13.0
1000H.: (6.0...16.0)
2nd speed 1/min: 500
Del.quantity cm3/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
Charge press. hPa: -
Del.quantity cm3/: -
ind. 1000H: 45.0
2nd speed 1/min: 450
Charge press. hPa: -
Del.quantity cm3/: -
max. 1000H : 55.0

Shutoff electromagnet:

Cut-in
min. voltage : 20.0
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.2...1.6
SVS max.	mm	:	1.2

Remarks:

:
Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W42
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R373-2
Type number : 0 460 426 145
Customer Part-No. : 3 916 999

Customer-specific information
Customer : CDC

Engine : 6 BTA - 5.9 IND.

Power k: 124
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.85
mm: $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 1.5...1.9

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 2.9...3.5

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 94.5...95.5
Dispersion cm³/ : 4.0
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 50.5...51.5
Dispersion cm³/ : 9.0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm³/
1000H.: 8.0...12.0
Dispersion cm³/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 73.0...79.0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm³/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000

TD travel mm: 0.5...1.4
mm: (0.2...1.6)
2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1.5...1.9
mm: (1.0...2.4)
3rd speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 2.5...3.4
mm: (2.2...3.6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 1.8...2.4
bar: (1.6...2.6)
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 2.9...3.5
bar: (2.7...3.7)
3rd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump pressure bar: 4.3...4.9
bar: (4.1...5.1)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow quantity cm³/10s: 41...83
(26...98)
2nd speed 1/min: 1050
Charge press. hPa: 1000
Overflow quantity cm³/10s: 55...138
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 300
LDA stroke mm: 7,3
Del.quantity cm³/: 79.5...80.5
1000H.: (75.5...84.5)
2nd speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
3rd speed 1/min: 1140
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
4th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 73.0...79.0
1000H.: (70.0...82.0)

5th speed 1/min: 1050
Charge press. hPa: 1000
Del.quantity cm³/: 83.5...86.5
1000H.: (82.0...88.0)
6th speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm³/: 87.5...90.5
1000H.: (86.0...92.0)
7th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 94.5...95.5
1000H.: (92.0...98.0)
8th speed 1/min: 500
Charge press. hPa: 1000
Del.quantity cm³/: 98.0...106.0
1000H.: -
9th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 50.5...51.5
1000H.: (46.5...55.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...12.0
1000H.: (5.0...15.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 250
Charge press. hPa: -
Del.quantity cm³/: -
ind. 1000H: 45.0
2nd speed 1/min: 450
Charge press. hPa: -
Del.quantity cm³/: -
max. 1000H : 55.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.2...1.6
SVS max.	mm	:	1.2

Remarks:

:
Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W35
Edition : 19.04.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1100 R376
Type number : 0 460 426 147

Customer-specific information
Customer : CDC

Engine : 6 BT

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 1,5
mm: $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,1...3,5

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 4,1...4,7

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 83,5...84,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 360
Del.quantity cm3/
1000H.: 4,0...10,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm3/
1000H: 50,0...56,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 80,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,0...1,8
mm: (0,7...2,1)
2nd speed 1/min: 750
TD travel mm: 3,1...3,5
mm: (2,6...4,0)
3rd speed 1/min: 1100
TD travel mm: 5,6...6,4
mm: (5,3...6,7)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3,0...3,6
2nd speed 1/min: 750
Supply-pump
pressure bar: 4,1...4,7
3rd speed 1/min: 1100

Supply-pump
pressure bar: 5,7...6,3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1175
Del.quantity cm³/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1150
Del.quantity cm³/: 50,0...56,0
1000H.: (47,0...59,0)
4th speed 1/min: 1100
Del.quantity cm³/: 69,5...72,5
1000H.: (68,0...74,0)
5th speed 1/min: 900
Del.quantity cm³/: 71,5...74,5
1000H.: (69,5...76,5)
6th speed 1/min: 750
Del.quantity cm³/: 83,5...84,5
1000H.: (81,0...87,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 360
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360
Del.quantity cm³/: 4,0...10,0
1000H.: (2,0...12,0)
2nd speed 1/min: 460
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del.quantity cm³/: -
ind. 1000H: 95,0

2nd speed 1/min: 250
Del.quantity cm³/: -
max. 1000H : 95,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	1,2...1,6
SVS max.	mm	:	1,8
XK	mm	:	18,8...20,8
XL	mm	:	11,9...15,3

Remarks:

: C.D.C. # 391 7559
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W9
Edition : 04.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R381
Type number : 0 460 426 152

Customer-specific information
Customer : CDC

Engine : 6 BT

Power k: 96
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm : 1,5
mm : +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm3/
1000H.: 63,5...64,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 345
Del.quantity cm3/
1000H.: 9,0...15,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1320
Del.quantity cm3/
1000H.: 44,5...50,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,6)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,4...3,0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3,5...4,1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1450
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1330
Del.quantity cm³/: 15,0...45,0
1000H.: -
3rd speed 1/min: 1320
Del.quantity cm³/: 44,5...50,5
1000H.: (41,5...53,5)
4th speed 1/min: 1250
Del.quantity cm³/: 61,0...64,0
1000H.: (59,5...65,5)
5th speed 1/min: 1100
Del.quantity cm³/: 63,5...64,5
1000H.: (61,0...67,0)
6th speed 1/min: 750
Del.quantity cm³/: 64,0...68,0
1000H.: (62,0...70,0)
7th speed 1/min: 500
Del.quantity cm³/: 65,0...73,0
1000H.: (63,0...75,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 345
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 345
Del.quantity cm³/: 9,0...15,0
1000H.: (7,0...17,0)
2nd speed 1/min: 500

Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 100
Del.quantity cm³/: -
ind. 1000H.: 55,0

2nd speed 1/min: 450
Del.quantity cm³/: -
max. 1000H.: 75,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 1,0...1,4
SVS max. mm : 1,4

Remarks:

: C.D.C. # 391 6936
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W10
Edition : 04.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R381
Type number : 0 460 426 152
Customer Part-No. : 3 916 937

Customer-specific information
Customer : CDC

Engine : 6 BT

Power k: 96
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 1,5
mm: $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm³/
1000H.: 63,5...64,5
Dispersion cm³/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 345
Del.quantity cm³/
1000H.: 9,0...15,0
Dispersion cm³/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1320
Del.quantity cm³/
1000H: 44,5...50,5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,6)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,4...3,0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3,5...4,1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1450
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1330
Del.quantity cm³/: 15,0...45,0
1000H.: -
3rd speed 1/min: 1320
Del.quantity cm³/: 44,5...50,5
1000H.: (41,5...53,5)
4th speed 1/min: 1250
Del.quantity cm³/: 61,0...64,0
1000H.: (59,5...65,5)
5th speed 1/min: 1100
Del.quantity cm³/: 63,5...64,5
1000H.: (61,0...67,0)
6th speed 1/min: 750
Del.quantity cm³/: 64,0...68,0
1000H.: (62,0...70,0)
7th speed 1/min: 500
Del.quantity cm³/: 65,0...73,0
1000H.: (63,0...75,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 345
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 345
Del.quantity cm³/: 9,0...15,0
1000H.: (7,0...17,0)
2nd speed 1/min: 500

Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 100
Del.quantity cm³/: -
ind. 1000H.: 55,0

2nd speed 1/min: 450
Del.quantity cm³/: -
max. 1000H.: 75,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 1,0...1,4
SVS max. mm : 1,4

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9W12
Edition : 20.04.90
replaces : 14.11.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-1
Type number : 0 460 426 153

Customer-specific information
Customer : CDC

Engine : 6 BT-5.9 IND.

Power k: 104
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,5
mm: +0,02(0,06)

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 71,5...72,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1140
Del.quantity cm3/
1000H.: 53,0...59,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,7)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,4...3,0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3,5...4,1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1220
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1160
Del.quantity cm³/: 15,0...45,0
1000H.: -
3rd speed 1/min: 1140
Del.quantity cm³/: 53,0...59,0
1000H.: (50,0...62,0)
4th speed 1/min: 1100
Del.quantity cm³/: 66,5...69,5
1000H.: (65,0...71,0)
5th speed 1/min: 900
Del.quantity cm³/: 71,5...72,5
1000H.: (69,0...75,0)
6th speed 1/min: 750
Del.quantity cm³/: 70,5...74,5
1000H.: (68,5...76,5)
7th speed 1/min: 500
Del.quantity cm³/: 56,0...64,0
1000H.: (54,0...66,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
El.AB volt: 24,0
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...14,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450

Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 60,0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 0,8...1,2
SVS max. mm : 1,4

Remarks:

: C.D.C. # 391 6920
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

Pushing electromagnet.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9W45
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-1
Type number : 0 460 426 153
Customer Part-No. : 3 916 919

Customer-specific information
Customer : CDC

Engine : 6 BT-5.9 IND.

Power k: 104
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 1,5
mm: $\pm 0,02(0,06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 71,5...72,5
Dispersion cm³/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 8,0...14,0
Dispersion cm³/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1140
Del.quantity cm³/
1000H.: 53,0...59,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,7)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,4...3,0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3,5...4,1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1220
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1160
Del.quantity cm³/: 15,0...45,0
1000H.: -
3rd speed 1/min: 1140
Del.quantity cm³/: 53,0...59,0
1000H.: (50,0...62,0)
4th speed 1/min: 1100
Del.quantity cm³/: 66,5...69,5
1000H.: (65,0...71,0)
5th speed 1/min: 900
Del.quantity cm³/: 71,5...72,5
1000H.: (69,0...75,0)
6th speed 1/min: 750
Del.quantity cm³/: 70,5...74,5
1000H.: (68,5...76,5)
7th speed 1/min: 500
Del.quantity cm³/: 56,0...64,0
1000H.: (54,0...66,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: 24,0
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...14,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450

Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 60,0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 0,8...1,2
SVS max. mm : 1,4

Remarks:

:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

Pushing electromagnet.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W46
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-1
Type number : 0 460 426 153
Customer Part-No. : 3 916 977

Customer-specific information
Customer : CDC

Engine : 6 BT-5.9 IND.

Power k: 104
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 1,5
mm: $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 71,5...72,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1140
Del.quantity cm3/
1000H: 53,0...59,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 60,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,7)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1100
TD travel mm: 5,2...6,0
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,4...3,0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3,5...4,1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1220
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1160
Del.quantity cm³/: 15,0...45,0
1000H.: -
3rd speed 1/min: 1140
Del.quantity cm³/: 53,0...59,0
1000H.: (50,0...62,0)
4th speed 1/min: 1100
Del.quantity cm³/: 66,5...69,5
1000H.: (65,0...71,0)
5th speed 1/min: 900
Del.quantity cm³/: 71,5...72,5
1000H.: (69,0...75,0)
6th speed 1/min: 750
Del.quantity cm³/: 70,5...74,5
1000H.: (68,5...76,5)
7th speed 1/min: 500
Del.quantity cm³/: 56,0...64,0
1000H.: (54,0...66,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: 24,0
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8,0...14,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450

Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 60,0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 60,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 0,8...1,2
SVS max. mm : 1,4

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

Pushing electromagnet.

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W8
Edition : 20.04.90
replaces : 25.10.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-2
Type number : 0 460 426 154

Customer-specific information
Customer : CDC

Engine : 6 BT - 5.9 IND.

Power k: 89.0
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.5
mm: $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.5...4.1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 62.0...63.0
Dispersion cm³/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 10.0...12.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm³/
1000H: 39.0...45.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.5...2.3
mm: (1.2...2.6)
2nd speed 1/min: 750
TD travel mm: 3.4...3.8
mm: (2.9...4.3)
3rd speed 1/min: 1100
TD travel mm: 5.6...6.4
mm: (5.3...6.7))

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.4...3.0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3.5...4.1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4.8...5.4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
2nd speed 1/min: 1170
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
3rd speed 1/min: 1150
Del.quantity cm³/: 39.0...45.0
1000H.: (36.0...48.0)
4th speed 1/min: 1100
Del.quantity cm³/: 59.0...62.0
1000H.: (57.5...63.5)
5th speed 1/min: 900
Del.quantity cm³/: 61.5...64.5
1000H.: (59.5...66.5)
6th speed 1/min: 750
Del.quantity cm³/: 62.0...63.0
1000H.: (59.5...65.5)
7th speed 1/min: 500
Del.quantity cm³/: 57.0...65.0
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 10...12
1000H.: (6.0...16.0)
2nd speed 1/min: 500

Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 70.0

2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H.: 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 20.0
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 1.2...1.6
SVS max. mm : -

Remarks:

: C.D.C. # 391 6975
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W48
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-2
Type number : 0 460 426 154
Customer Part-No. : 3 916 968

Customer-specific information
Customer : CDC

Engine : 6 BT - 5.9 IND.

Power k: 91.0
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.5
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.5...4.1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 62.0...63.0
Dispersion cm³/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 10.0...12.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm³/
1000H.: 39.0...45.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.5...2.3
mm: (1.2...2.6)
2nd speed 1/min: 750
TD travel mm: 3.4...3.8
mm: (2.9...4.3)
3rd speed 1/min: 1100
TD travel mm: 5.6...6.4
mm: (5.3...6.7))

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.4...3.0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3.5...4.1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4.8...5.4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
2nd speed 1/min: 1170
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
3rd speed 1/min: 1150
Del.quantity cm³/: 39.0...45.0
1000H.: (36.0...48.0)
4th speed 1/min: 1100
Del.quantity cm³/: 59.0...62.0
1000H.: (57.5...63.5)
5th speed 1/min: 900
Del.quantity cm³/: 61.5...64.5
1000H.: (59.5...66.5)
6th speed 1/min: 750
Del.quantity cm³/: 62.0...63.0
1000H.: (59.5...65.5)
7th speed 1/min: 500
Del.quantity cm³/: 57.0...65.0
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 10...12
1000H.: (6.0...16.0)
2nd speed 1/min: 500

Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 70.0

2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H.: 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 1.2...1.6
SVS max. mm : -

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W47
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-2
Type number : 0 460 426 154
Customer Part-No. : 3 916 974

Customer-specific information
Customer : CDC

Engine : 6 BT - 5.9

Power k: 92,5
Speed 1/mi: 2400

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): ±0.02(0.04)

Start of delivery block
Piston stroke mm: 1.5
mm: ±0.02(0.06)

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.5...4.1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 62.5...63.5
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 340
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1280
Del.quantity cm3/
1000H: 32.0...38.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 75.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.5...2.3
mm: (1.2...2.6)
2nd speed 1/min: 750
TD travel mm: 3.4...3.8
mm: (2.9...4.3)
3rd speed 1/min: 1100
TD travel mm: 5.6...6.4
mm: (5.3...6.7))

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.4...3.0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3.5...4.1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4.8...5.4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1350
Del.quantity cm³/: 0.0...15,0
1000H.: -
2nd speed 1/min: 1330
Del.quantity cm³/: 15.0...55.0
1000H.: -
3rd speed 1/min: 1280
Del.quantity cm³/: 32.0...38.0
1000H.: (29.0...41.0)
4th speed 1/min: 1200
Del.quantity cm³/: 59,5...62,5
1000H.: (58.0...64,0)
5th speed 1/min: 1100
Del.quantity cm³/: 60.5...63.5
1000H.: (58.5...65.5)
6th speed 1/min: 750
Del.quantity cm³/: 62.5...63.5
1000H.: (60,0...66,0)
7th speed 1/min: 500
Del.quantity cm³/: 55,0...63,0
1000H.: (53,0...65,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 340
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 340
Del.quantity cm³/: 8,0...14,0
1000H.: (6.0...16.0)
2nd speed 1/min: 500

Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 70.0

2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H.: 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 1.2...1.6
SVS max. mm : -

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W13
Edition : 20.04.90
replaces : 15.11.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-3
Type number : 0 460 426 155

Customer-specific information
Customer : CDC

Engine : 6 BT - 5.9 IND.

Power k: 105
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.5
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.7...4.3

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 75,0...76,0
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 10.0...12.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1100
Del.quantity cm3/
1000H: 52.0...58.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.3...2.1
mm: (1.0...2.4)
2nd speed 1/min: 750
TD travel mm: 3.4...3.8
mm: (2.9...4.3)
3rd speed 1/min: 1050
TD travel mm: 5.0...5,8
mm: (4,7...6,1))

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.6...3.2
2nd speed 1/min: 750

Supply-pump
pressure bar: 3.7...4.3
3rd speed 1/min: 1050
Supply-pump
pressure bar: 4.9...5.5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200
Del.quantity cm³/: 0.0...3.0
1000H.: (0.0...3.0)
2nd speed 1/min: 1130
Del.quantity cm³/: 15.0...45.0
1000H.: -
3rd speed 1/min: 1100
Del.quantity cm³/: 52.0...58.0
1000H.: (49.0...61.0)
4th speed 1/min: 1050
Del.quantity cm³/: 69,5...72,5
1000H.: (68,0...74,0)
5th speed 1/min: 900
Del.quantity cm³/: 72,5...75,5
1000H.: (70,5...77,5)
6th speed 1/min: 750
Del.quantity cm³/: 75,0...76,0
1000H.: (72,5...78,5)
7th speed 1/min: 500
Del.quantity cm³/: 61,5...69,5
1000H.: (59,5...71,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 10,0...12,
1000H.: (6.0...16.0)
2nd speed 1/min: 450

Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 60.0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 60.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation :
K mm : -
KF mm : 5.0...5.4
MS mm : 0,8...1.2
SVS max. mm : -

Remarks:

: C.D.C. # 391 6923
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W50
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-3
Type number : 0 460 426 155
Customer Part-No. : 3 916 923

Customer-specific information
Customer : CDC

Engine : 6 BT - 5.9 IND.

Power k: 105
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.5
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.7...4.3

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 75,0...76,0
Dispersion cm³/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 10.0...12.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1100
Del.quantity cm³/
1000H: 52.0...58.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.3...2.1
mm: (1.0...2.4)
2nd speed 1/min: 750
TD travel mm: 3.4...3.8
mm: (2.9...4.3)
3rd speed 1/min: 1050
TD travel mm: 5.0...5,8
mm: (4,7...6,1))

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.6...3.2
2nd speed 1/min: 750

Supply-pump
pressure bar: 3.7...4.3
3rd speed 1/min: 1050
Supply-pump
pressure bar: 4.9...5.5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200
Del.quantity cm3/: 0.0...3.0
1000H.: (0.0...3.0)
2nd speed 1/min: 1130
Del.quantity cm3/: 15.0...45.0
1000H.: -
3rd speed 1/min: 1100
Del.quantity cm3/: 52.0...58.0
1000H.: (49.0...61.0)
4th speed 1/min: 1050
Del.quantity cm3/: 69,5...72,5
1000H.: (68,0...74,0)
5th speed 1/min: 900
Del.quantity cm3/: 72,5...75,5
1000H.: (70,5...77,5)
6th speed 1/min: 750
Del.quantity cm3/: 75,0...76,0
1000H.: (72,5...78,5)
7th speed 1/min: 500
Del.quantity cm3/: 61,5...69,5
1000H.: (59,5...71,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm3/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm3/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm3/: 10,0...12,
1000H.: (6.0...16.0)
2nd speed 1/min: 450

Del.quantity cm3/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H.: 60.0

2nd speed 1/min: 240
Del.quantity cm3/: -
max. 1000H.: 60.0

Shutoff electromagnet:

Cut-in
min. voltage : 20.0
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 0,8...1.2
SVS max. mm : -

Remarks:

:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W14
Edition : 20.04.90
replaces : 15.11.89
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-4
Type number : 0 460 426 156

Customer-specific information
Customer : CDC

Engine : 6 BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm : 1,5
mm : $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 4,2...4,6

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,7...5,3

Full-load del. w/out charge press.:

Speed 1/min : 1000
Del.quantity cm³/
1000H.: 67,0...68,0
Dispersion cm³/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm³/
1000H.: 11,0...13,0
Dispersion cm³/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm³/
1000H.: 44,3...50,3

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 2,9...3,7
mm: (2,6...4,0)
2nd speed 1/min: 900
TD travel mm: 4,2...4,6
mm: (3,7...5,1)
3rd speed 1/min: 1100
TD travel mm: 5,5...6,3
mm: (5,2...6,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,9...3,5
2nd speed 1/min: 750
Supply-pump
pressure bar: 4,0...4,6
3rd speed 1/min: 900

Supply-pump
pressure bar: 4,7...5,3
4th speed 1/min: 1100
Supply-pump
pressure bar: 5,5...6,1

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1240
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1180
Del.quantity cm³/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1150
Del.quantity cm³/: 44,3...50,3
1000H.: (41,3...53,3)
4th speed 1/min: 1100
Del.quantity cm³/: 64,5...67,5
1000H.: (63,0...69,0)
5th speed 1/min: 1000
Del.quantity cm³/: 67,0...68,0
1000H.: (64,5...70,5)
6th speed 1/min: 750
Del.quantity cm³/: 83,0...87,0
1000H.: (81,0...89,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0,0...3,0

Idle delivery:

1st speed 1/min: 400
Del.quantity cm³/: 11,0...13,0
1000H.: (7,0...17,0)
2nd speed 1/min: 500
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 80,0

2nd speed 1/min: 250
Del.quantity cm³/: -
max. 1000H : 100,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 1,3...1,7
SVS max. mm : 2,2

Remarks:

: C.D.C. # 391 6946
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W51
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-4
Type number : 0 460 426 156
Customer Part-No. : 3 916 945

Customer-specific information
Customer : CDC

Engine : 6 BT-5.9 IND.

Power k: 93
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil:
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 1,5
mm: $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 4,2...4,6

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4,7...5,3

Full-load del. w/out charge press.:

Speed 1/min : 1000
Del.quantity cm³/
1000H.: 67,0...68,0
Dispersion cm³/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm³/
1000H.: 11,0...13,0
Dispersion cm³/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm³/
1000H.: 44,3...50,3

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 2,9...3,7
mm: (2,6...4,0)
2nd speed 1/min: 900
TD travel mm: 4,2...4,6
mm: (3,7...5,1)
3rd speed 1/min: 1100
TD travel mm: 5,5...6,3
mm: (5,2...6,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,9...3,5
2nd speed 1/min: 750

Supply-pump
pressure bar: 4,0...4,6
3rd speed 1/min: 900
Supply-pump
pressure bar: 4,7...5,3
4th speed 1/min: 1100
Supply-pump
pressure bar: 5,5...6,1

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1240
Del.quantity cm3/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1180
Del.quantity cm3/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1150
Del.quantity cm3/: 44,3...50,3
1000H.: (41,3...53,3)
4th speed 1/min: 1100
Del.quantity cm3/: 64,5...67,5
1000H.: (63,0...69,0)
5th speed 1/min: 1000
Del.quantity cm3/: 67,0...68,0
1000H.: (64,5...70,5)
6th speed 1/min: 750
Del.quantity cm3/: 83,0...87,0
1000H.: (81,0...89,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm3/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm3/: 0,0...3,0

Idle delivery:

1st speed 1/min: 400
Del.quantity cm3/: 11,0...13,0
1000H.: (7,0...17,0)
2nd speed 1/min: 500

Del.quantity cm3/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 80,0

2nd speed 1/min: 250
Del.quantity cm3/: -
max. 1000H : 100,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : -
KF mm : 5,0...5,4
MS mm : 1,3...1,7
SVS max. mm : 2,2

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W36
 Edition : 20.04.90
 replaces : -
 Calibrating oil : ISO 4113
 Injection pump : VE 6/12F1050 R381-5
 Type number : 0 460 426 157
 Customer-specific information
 Customer : CDC
 Engine : 6 BT
 Power k: 93
 Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50
 Inlet press., bar : 0.35
 Calibrating nozzle-holder
 assembly : 1 688 901 027
 Opening
 pressure bar : 250...253
 Perforated-plate
 diameter mm : 0.5
 Test inj. tubing : 1 680 750 017
 Outside diameter : 6
 x Wall thickness : 2
 x Length mm : 840
 Start of delivery
 Prestroke mm : 0,3
 (from BDC): $\pm 0,02(0,04)$
 Start of delivery block
 Piston stroke mm : 1,5
 mm: $\pm 0,02(0,06)$
 Outlet : D
 Injection-pump setting values
 Test specifications in parentheses
 Timing-device travel:

Speed 1/min: 750
 Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
 Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 750
 Del.quantity cm³/
 1000H.: 64,5...65,5
 Dispersion cm³/: 4,0
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
 Del.quantity cm³/
 1000H.: 10,0...12,0
 Dispersion cm³/: 5,5
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1100
 Del.quantity cm³/
 1000H: 46,0...52,0

Start:

Speed 1/min: 100
 Del.quantity : -
 mind cm³/1000H.: 70,0

Inspection-pump test specifications
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
 TD travel mm: 1,5...2,3
 mm: (1,2...2,6)
 2nd speed 1/min: 750
 TD travel mm: 3,4...3,8
 mm: (2,9...4,3)
 3rd speed 1/min: 1050
 TD travel mm: 5,0...5,8
 mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Supply-pump
 pressure bar: 2,4...3,0
 2nd speed 1/min: 750

Supply-pump
pressure bar: 3,5...4,1
3rd speed 1/min: 1050
Supply-pump
pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250
Del.quantity cm3/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1130
Del.quantity cm3/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1100
Del.quantity cm3/: 46,0...52,0
1000H.: (43,0...55,0)
4th speed 1/min: 1050
Del.quantity cm3/: 60,5...63,5
1000H.: (59,0...65,0)
5th speed 1/min: 900
Del.quantity cm3/: 62,0...65,0
1000H.: (60,0...67,0)
6th speed 1/min: 750
Del.quantity cm3/: 64,5...65,5
1000H.: (62,0...68,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm3/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm3/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm3/: 10,0...12,0
1000H.: (6,0...16,0)
2nd speed 1/min: 500
Del.quantity cm3/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 70,0

2nd speed 1/min: 350
Del.quantity cm3/: -
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 1,3...1,7
SVS max. mm : -

Remarks:

: C.D.C. # 391 6933
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W52
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R381-5
Type number : 0 460 426 157
Customer Part-No. : 3 916 933

Customer-specific information
Customer : CDC

Engine : 6 BT

Power k: 93
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,5
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 64,5...65,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 10,0...12,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1100
Del.quantity cm3/
1000H: 46,0...52,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,5...2,3
mm: (1,2...2,6)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1050
TD travel mm: 5,0...5,8
mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,4...3,0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3,5...4,1
3rd speed 1/min: 1050
Supply-pump
pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1130
Del.quantity cm³/: 15,0...55,0
1000H.: -
3rd speed 1/min: 1100
Del.quantity cm³/: 46,0...52,0
1000H.: (43,0...55,0)
4th speed 1/min: 1050
Del.quantity cm³/: 60,5...63,5
1000H.: (59,0...65,0)
5th speed 1/min: 900
Del.quantity cm³/: 62,0...65,0
1000H.: (60,0...67,0)
6th speed 1/min: 750
Del.quantity cm³/: 64,5...65,5
1000H.: (62,0...68,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 10,0...12,0
1000H.: (6,0...16,0)
2nd speed 1/min: 500
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 70,0

2nd speed 1/min: 350
Del.quantity cm³/: -
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 1,3...1,7
SVS max. mm : -

Remarks:

:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W26
Edition : 28.3.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1400 R387
Type number : 0 460 426 163

Customer-specific information
Customer : CDC

Engine : 6 BTA-5,9 AUTO

Power k: 160
Speed 1/mi: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm: 1,1
mm: $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Charge press. hPa: 1000
Setting value mm: 4,2...4,6

Supply-pump pressure:

Speed 1/min: 900
Charge press. hPa: 1000
Setting value bar: 4,1...4,7

Full-load del. with charge press.:

Speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 67,0...68,0
Dispersion cm3/ : 4,0
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 30,0...31,5

Low-idle speed regulation:

Speed 1/min: 360
Charge press. hPa: -
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1530
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 49,0...55,0

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm3/1000H.: 45,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
TD travel mm: 0,4...1,2
mm: (0,1...1,5)
2nd speed 1/min: 900

Charge press. hPa: 1000
 TD travel mm: 4,2...4,6
 mm: (3,7...5,1)
 3rd speed 1/min: 1100
 Charge press. hPa: 1000
 TD travel mm: 5,5...6,3
 mm: (5,2...6,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 2,4...3,0
 bar: (2,2...3,2)
 2nd speed 1/min: 900
 Charge press. hPa: 1000
 Supply-pump pressure bar: 4,1...4,7
 bar: (3,9...4,9)
 3rd speed 1/min: 1400
 Charge press. hPa: 1000
 Supply-pump pressure bar: 6,1...6,7
 bar: (5,9...6,9)

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Charge press. hPa: -
 Overflow : 15...30
 quantity cm³/10s: -
 2nd speed 1/min: 1400
 Charge press. hPa: 1000
 Overflow : 20...50
 quantity cm³/10s: -

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
 Charge-air pressure-setting point hPa: 500
 Del.quantity cm³/: 59,0...60,0
 1000H.: (55,5...63,5)
 2nd speed 1/min: 1700
 Charge press. hPa: 1000
 Del.quantity cm³/: 0,0...3,0
 1000H.: -
 3rd speed 1/min: 1620
 Charge press. hPa: 1000
 Del.quantity cm³/: 15,0...55,0
 1000H.: -
 4th speed 1/min: 1530
 Charge press. hPa: 1000
 Del.quantity cm³/: 49,0...55,0
 1000H.: (46,0...58,0)
 5th speed 1/min: 1400
 Charge press. hPa: 1000
 Del.quantity cm³/: 61,5...64,5
 1000H.: (60,0...66,0)

6th speed 1/min: 1100
 Charge press. hPa: 1000
 Del.quantity cm³/: 64,5...67,5
 1000H.: (62,5...69,5)
 7th speed 1/min: 900
 Charge press. hPa: 1000
 Del.quantity cm³/: 67,0...68,0
 1000H.: (64,5...70,5)
 8th speed 1/min: 500
 Charge press. hPa: -
 Del.quantity cm³/: 30,5...31,5
 1000H.: (27,0...35,0)
 9th speed 1/min: 500
 Charge press. hPa: 1000
 Del.quantity cm³/: 65,5...73,5
 1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400
 Del.quantity cm³/: 0...3
 1000H.: -

Electr. shutoff:

Speed 1/min: 360
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 360
 Del.quantity cm³/: 8,0...14,0
 1000H.: (6,0...16,0)
 2nd speed 1/min: 450
 Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 300
 Del.quantity cm³/: -
 ind. 1000H.: 55,0
 2nd speed 1/min: 480
 Del.quantity cm³/: -
 max. 1000H.: 55,0

Shutoff electromagnet:

Cut-in
 min. voltage : 10,0
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
 K mm : -

KF	mm	: 5,0...5,4
MS	mm	: 1,3
SVS max.	mm	: 2,0
XK	mm	: -
XL	mm	: -

Remarks:

: C.D.C. # 391 6914

* Correction at adjusting nut (46)

Operate control lever after each manifold-pressure compensator pressure change.

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W37
Edition : 20.04.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1000 R381-6
Type number : 0 460 426 164

Customer-specific information
Customer : CDC

Engine : 6 BT

Power k: 64
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,5
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,3...3,7

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 46,5...47,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 365
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1050
Del.quantity cm3/
1000H.: 30,0...36,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 40,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,1...1,9
mm: (0,8...2,2)
2nd speed 1/min: 750
TD travel mm: 3,3...3,7
mm: (2,8...4,2)
3rd speed 1/min: 1000
TD travel mm: 5,3...6,1
mm: (5,0...6,4)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,4...3,0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3,5...4,1
3rd speed 1/min: 1000
Supply-pump
pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1150
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1060
Del.quantity cm³/: 15,0...45,0
1000H.: -
3rd speed 1/min: 1050
Del.quantity cm³/: 30,0...36,0
1000H.: (27,0...39,0)
4th speed 1/min: 1000
Del.quantity cm³/: 44,5...47,5
1000H.: (43,0...49,0)
5th speed 1/min: 900
Del.quantity cm³/: 46,5...49,5
1000H.: (44,5...51,5)
6th speed 1/min: 750
Del.quantity cm³/: 46,5...47,5
1000H.: (44,0...50,0)
7th speed 1/min: 600
Del.quantity cm³/: 38,5...46,5
1000H.: (36,5...48,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1000
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 365
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 365
Del.quantity cm³/: 8,0...14,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450

Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 100
Del.quantity cm³/: -
ind. 1000H.: 40

2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H.: 65,0

Shutoff electromagnet:

Cut-in
min. voltage : 20,0
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 1,0...1,4
SVS max. mm : 1,4

Remarks:

: C.D.C. # 391 6931
Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W53
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1000 R381-6
Type number : 0 460 426 164
Customer Part-No. : 3 916 930

Customer-specific information
Customer : CDC

Engine : 6 BT

Power k: 64
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): $\pm 0,02(0,04)$

Start of delivery block
Piston stroke mm : 1,5
mm : $\pm 0,02(0,06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,3...3,7

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 46,5...47,5
Dispersion cm³/ : 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 365
Del.quantity cm³/
1000H.: 8,0...14,0
Dispersion cm³/ : 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1050
Del.quantity cm³/
1000H.: 30,0...36,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 40,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,1...1,9
mm: (0,8...2,2)
2nd speed 1/min: 750
TD travel mm: 3,3...3,7
mm: (2,8...4,2)
3rd speed 1/min: 1000
TD travel mm: 5,3...6,1
mm: (5,0...6,4)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,4...3,0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3,5...4,1
3rd speed 1/min: 1000
Supply-pump
pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1150
Del.quantity cm3/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1060
Del.quantity cm3/: 15,0...45,0
1000H.: -
3rd speed 1/min: 1050
Del.quantity cm3/: 30,0...36,0
1000H.: (27,0...39,0)
4th speed 1/min: 1000
Del.quantity cm3/: 44,5...47,5
1000H.: (43,0...49,0)
5th speed 1/min: 900
Del.quantity cm3/: 46,5...49,5
1000H.: (44,5...51,5)
6th speed 1/min: 750
Del.quantity cm3/: 46,5...47,5
1000H.: (44,0...50,0)
7th speed 1/min: 600
Del.quantity cm3/: 38,5...46,5
1000H.: (36,5...48,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1000
Del.quantity cm3/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 365
ELAB volt: -
Del.quantity cm3/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 365
Del.quantity cm3/: 8,0...14,0
1000H.: (6,0...16,0)
2nd speed 1/min: 450

Del.quantity cm3/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 100
Del.quantity cm3/: -
ind. 1000H.: 40

2nd speed 1/min: 400
Del.quantity cm3/: -
max. 1000H.: 65,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 1,0...1,4
SVS max. mm : 1,4

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W27
Edition : 28.3.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R373-6
Type number : 0 460 426 172

Customer-specific information
Customer : CUMMINS

Engine : 6 BTA5,9

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 016

Opening
pressure bar : 207...210

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): →0,02(0,04)

Start of delivery block
Piston stroke mm : 1,6
mm: →0,02(0,06)

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 750

Setting value mm: 2,6...3,0

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 750
Setting value bar: 4,9...5,5

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 750
Del.quantity cm3/
1000H.: 91,0...92,0
Dispersion cm3/ : 4,0
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 66,0...67,0

Low-idle speed regulation:

Speed 1/min: 375
Charge press. hPa: -
Del.quantity cm3/
1000H.: 21,5...25,5
Dispersion cm3/ : 3,5
1000H.: (6,0)

Full-load speed regulation:

Speed 1/min: 1100
Charge press. hPa: 750
Del.quantity cm3/
1000H: 64,5...70,5

Start:

Speed 1/min: 100
Charge press. hPa: -
Del.quantity : -
mind cm3/1000H.: 35,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 750
TD travel mm: 0,6...1,4
mm: (0,3...1,7)
2nd speed 1/min: 750
Charge press. hPa: 750
TD travel mm: 2,6...3,0
mm: (2,1...3,5)

3rd speed 1/min: 1100
Charge press. hPa: 750
TD travel mm: 4,8...5,6
mm: (4,5...5,9)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 750
Supply-pump pressure bar: 3,8...4,4
bar: (3,5...4,7)
2nd speed 1/min: 750
Charge press. hPa: 750
Supply-pump pressure bar: 4,9...5,5
bar: (4,6...5,8)
3rd speed 1/min: 1100
Charge press. hPa: 750
Supply-pump pressure bar: 6,4...7,0
bar: (6,1...7,3)

Overflow quantity at overflow valve:

1st speed 1/min: 500
Charge press. hPa: -
Overflow : 15...30
quantity cm³/10s: -
2nd speed 1/min: 1050
Charge press. hPa: 750
Overflow : 20...50
quantity cm³/10s: -

Delivery-quant. and breakaway char.:

1st speed 1/min: 600
Charge-air pressure-setting point hPa: 400
Del.quantity cm³/: 82,5...83,5
1000H.: (79,0...87,0)
2nd speed 1/min: 1170
Charge press. hPa: 750
Del.quantity cm³/: 0,0...3,0
1000H.: -
3rd speed 1/min: 1120
Charge press. hPa: 750
Del.quantity cm³/: 0,0...15,0
1000H.: -
4th speed 1/min: 1100
Charge press. hPa: 750
Del.quantity cm³/: 64,5...70,5
1000H.: (61,5...73,5)
5th speed 1/min: 1050
Charge press. hPa: 750
Del.quantity cm³/: 78,5...81,5
1000H.: (77,0...83,0)
6th speed 1/min: 900
Charge press. hPa: 750

Del.quantity cm³/: 85,5...88,5
1000H.: (84,0...90,0)
7th speed 1/min: 750
Charge press. hPa: 750
Del.quantity cm³/: 91,0...92,0
1000H.: (87,5...94,5)
8th speed 1/min: 500
Charge press. hPa: -
Del.quantity cm³/: 66,0...67,0
1000H.: (62,5...70,5)
9th speed 1/min: 500
Charge press. hPa: 750
Del.quantity cm³/: 100,0...108,0
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 21,5...25,5
1000H.: (18,5...28,5)
2nd speed 1/min: 450
Del.quantity cm³/: 0,0...3,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 220
Del.quantity cm³/: -
ind. 1000H: 45,0
2nd speed 1/min: 420
Del.quantity cm³/: -
max. 1000H : 70,0

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5,0...5,4
MS mm : 1,3...1,7

SVS max. mm : -
XK mm : -
XL mm : -

Remarks:

: C.D.C. # 390 7544

* Correction at adjusting nut (46)

Operate control lever after each
manifold-pressure compensator pressure
change.

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W54
Edition : 04.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R381-7
Type number : 0 460 426 177

Customer-specific information
Customer : CDC

Engine : 6 BT

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,3
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm: 1,5
mm: +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3,7...4,3

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 73,0...74,0
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8,0...14,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1100
Del.quantity cm3/
1000H: 52,0...58,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 60,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,2...2,0
mm: (0,9...2,3)
2nd speed 1/min: 750
TD travel mm: 3,4...3,8
mm: (2,9...4,3)
3rd speed 1/min: 1050
TD travel mm: 4,9...5,7
mm: (4,6...6,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2,6...3,2
2nd speed 1/min: 750
Supply-pump
pressure bar: 3,7...4,3
3rd speed 1/min: 1050

Supply-pump pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Overflow : 41...83
 quantity cm³/10s: (26...98)

2nd speed 1/min: 1050
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200
 Del.quantity cm³/: 0,0...3,0
 1000H.: -

2nd speed 1/min: 1130
 Del.quantity cm³/: 15,0...45,0
 1000H.: -

3rd speed 1/min: 1100
 Del.quantity cm³/: 52,0...58,0
 1000H.: (49,0...61,0)

4th speed 1/min: 1050
 Del.quantity cm³/: 68,5...71,5
 1000H.: (67,0...73,0)

5th speed 1/min: 900
 Del.quantity cm³/: 70,5...74,5
 1000H.: (68,5...76,5)

6th speed 1/min: 750
 Del.quantity cm³/: 73,0...74,0
 1000H.: (70,5...76,5)

7th speed 1/min: 500
 Del.quantity cm³/: 59,0...67,0
 1000H.: (57,0...69,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
 Del.quantity cm³/: 0...3
 1000H.: -

Electr. shutoff:

Speed 1/min: 375
 ELAB volt: -
 Del.quantity cm³/: 0,0...3,0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
 Del.quantity cm³/: 8,0...14,0
 1000H.: (6,0...16,0)

2nd speed 1/min: 450
 Del.quantity cm³/: 0,0...4,0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
 Del.quantity cm³/: -
 ind. 1000H: 60,0

2nd speed 1/min: 240
 Del.quantity cm³/: -
 max. 1000H : 60,0

Shutoff electromagnet:

Cut-in
 min. voltage : 20,0
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation
 K mm : -
 KF mm : 5,0...5,4
 MS mm : 1,0...1,4
 SVS max. mm : 1,4

Remarks:
 : C.D.C. # 391 6923
 Heavy-duty fuel-injection pump for
 DI-engines: only test using timing-
 device-travel measuring device with
 metal jacket